

# Philippine Physics Journal

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## Philippine Physics Journal, Vol. 35 (2013)

### 35.01 **Constructing A Digital Planetarium in Your Classroom**

PPJ, Vol. 35 (2013), pp. 1-6

Engr. Philip P. Carpina

Bacolod Tay Tung High School

Bacolod City

### 35.02 **Atomic Hydrogen Adsorption and Desorption On/From Graphite Via the Armchair Edge: A Quantum Dynamics Study**

PPJ, Vol. 35 (2013), pp. 7-13

Michelle Natividad<sup>1</sup>, Melanie David<sup>1</sup>, Hideaki Kasai<sup>2</sup>, Nelson Arboleda Jr.<sup>1</sup>

<sup>1</sup> Physics Department

De La Salle University

2401 Taft Avenue, Manila, Philippines

<sup>2</sup> Department of Precision Science and Technology and Applied Physics

Osaka University

Osaka, Japan

#### **Abstract**

This study investigates the quantum mechanical behavior of the adsorption and desorption of hydrogen atom on/from graphite via the armchair edge. The adsorption and desorption probabilities of H are calculated using the coupled channel method via the Local Reflection (LORE) matrix and are plotted against the initial translational energy of H. The adsorption probability plot shows a non-activated reaction indicating that hydrogen is easily adsorbed on the surface of the graphite sheets. On the other hand, the desorption probability plot shows that desorption of H from the graphite sheets is an activated process with a barrier height of 4.19 eV. Due to this high barrier, desorption of the adsorbed H atom from the surface of the graphite sheets at operating temperatures (300-1500 K) of conventional fuel cells is unlikely to occur.

**35.03 Student-Student Verbal Interaction and Physics Performance in a Cooperative Learning Environment**

PPJ, Vol. 35 (2013), pp. 14-23

Edelyn Alicar-Cadorna, Ph.D and Erwin F. Cadorna, Ph.D

**Abstract**

Employing the exploratory and correlational research designs, the study determined the verbal interactions displayed by students working cooperatively in a Physics classroom environment. The study also investigated on the contribution of these verbal interactions on the Physics performance of the students.

Findings showed that the students in a cooperative learning environment have varied verbal interaction. They give and receive solicited as well as unsolicited help. They give and receive unsolicited help more than solicited help. In addition, students in a cooperative learning environment have a high Physics performance. Meanwhile, there is significant influence of student-student verbal interaction on student's performance in Physics. N verbal interaction with group members contributes to an enhanced learning as a reflected by high physics performance.

**35.04 Mathematics Anxiety and Physics Performance of Non-Physics Students**

PPJ, Vol. 35 (2013), pp. 24-34

Edelyn Alicar-Cadorna Ph.D, Grace A. Garcia MST Phys and Magdalena A. Ebojo BS Phys

**Abstract**

This study investigated the mathematics anxiety and performance in Physics of 102 non-Physics students. Mathematics anxiety was measured in terms of thinking Math, taking Math test, learning Math and solving Math problems. On the other hand, Physics performance was measured in terms of content and cognitive skill levels. The descriptive-correlational method of research was used in the study. Mathematics Anxiety Scale (MAS) of Fennema-Sherman and Physics Test were employed to gather needed data in the study.

Findings show that the mathematics anxiety exist among the non-Physics students. They experience an average level of Math anxiety with average level of anxiety in learning Math and solving math problems but a high level of anxiety in thinking about math and in taking math. Meanwhile, the respondents have a low level of performance in physics. Among the Physics concepts considered, they performed at an

average level in forces and work, energy and power but they performed low in vectors and scalars, one and two-dimensional motions. For the cognitive skill levels, they got an average performance in knowledge and a low performance in comprehension and application skill levels. Generally, the relationship between the overall math anxiety and overall Physics performance of the respondents is not statistically significant but anxiety in thinking about Math and overall Physics performance obtained a significant relationship.

**35.05 Interference Experiments Using Semiconductor Diode Laser**

PPJ, Vol. 35 (2013), pp. 35-44

Alwielland Q. Bello

Natural Sciences Department

Bukidnon State University

Malaybalay City, Bukidnon 8700

[alwielland@gail.com](mailto:alwielland@gail.com)

**Abstract**

A semiconductor diode laser has been utilized as light source for interference and polarization experiments. Under the interference experiments, the diffraction grating experiment obtained the experimental value of laser beam wavelength with maximum % error of 3.12 %, while the CD grating experiment obtained the experimental value of grating distance with maximum % error of 3.22 %.

**35.06 Determinants That Influence Teaching Efficacy Among Tertiary Introductory Physics Faculty**

PPJ, Vol. 35 (2013), pp. 45-56

Michelle Nena Nuñez Curada

Master of Arts in Teaching College Physics

**35.07 Beginning Teachers' Views on Science Learning: A Probe on Constructive and Traditional Frameworks**

PPJ, Vol. 35 (2013), pp. 57-64

Mario P. Obrero and Mariquit M. Obrero

University of Northern Philippines

Vigan City, Ilocos Sur

**Abstract**

This study dealt with the traditional and constructivist views of beginning elementary school teachers on science learning. Eighty-nine

respondents accomplished a questionnaire, consisting of 20 statements supporting either the traditional or the constructivist frameworks. Results showed that the five statements with the highest means were: a) Learning is the transmission of knowledge. b) Science is viewed as a codified body of knowledge; it is a set of facts, principles and procedures. c) Teachers are seen as learners themselves and as facilitators and collaborators in student learning. d) Classroom tasks are student-centered. e) Learning is the interpretation and negotiation of ideas; it is influenced by the learner's prior knowledge. The first two statements describe the traditional model while the next three support the constructivist framework. The respondents strongly agreed on four traditional views and eight constructivist views and agreed on the remaining six traditional and two constructivist statements. Beginning teachers should be trained on the use of constructivist teaching strategies to help them understand how constructivist learning differs from traditional learning, and to equip them with the skills of implementing a constructivist science classroom.

### 35.08 **Spatial Ability and Understanding of Graphs in Kinematics Among College Students**

PPJ, Vol. 35 (2013), pp. 65-76

Edelyn Alicar-Cadorna Ph D, Erwin F. Cadorna, Ph D and Felicidad D. Quario Ed D

#### **Abstract**

The study analyzed the spatial ability and understanding of graphs in kinematics of college students. Spatial ability was measured along developments, rotation and visualization. On the other hand, students' understanding of graphs in kinematics was focused on topics related to the interpretation of a slope of a line and area under a curve or line. The descriptive research design was employed in the study. The 203 students who were enrolled in Physics I completed the Purdue Spatial Visualization Test and the Test of Understanding of Graphs in Kinematics (TUG-K). The latter probed the students' understanding of graphs in kinematics.

Findings reveal that the students generally had an average level of spatial ability. They had an average level of ability on rotation, a low level of ability on visualization, but a high level of ability on developments. Meanwhile, the students had a low level of understanding of graphs in kinematics. They cannot fully understand how to interpret the slope of a curve or a line and the more they cannot understand

how to determine the area of a curve or a line. Findings also show that there was a significant influence of students' spatial ability on understanding of kinematics graph. Spatial ability along rotations and views, and sex predict the students' understanding of kinematic graphs.

**35.09 Physics Teachers' Constructivist-Related Instructional Practices**

PPJ, Vol. 35 (2013), pp. 77-87

Edelyn Alicar-Cadorna Ph D and Erwin F. Cadorna, Ph D

**Abstract**

The study examined the instructional practices linked with constructivism that are used by physics teachers in secondary schools. Using the descriptive normative research design, 45 physics teachers in selected secondary schools in the Division of Ilocos Sur, Vigan City Division and Candon City Division were requested to answer survey items which probed constructivist-related instructional practices. The instructional practices related to constructivism were classified into cognitively challenging and active learning.

Findings showed that, generally, the physics teachers used instructional practices related to constructivism in their classes. There were more teachers who used cognitively challenging instructional practices than active learning in Physics classes. In particular, the most commonly used cognitively challenging practice was problem solving and the most commonly used active learning practice was group work. They used these constructivist instructional practices when introducing new information, using learning activities and in assessing Physics learning.

**35.10 An Improvised Physical Pendulum with a Resistive Displacement Sensor**

PPJ, Vol. 35 (2013), pp. 88-99

Redentor S. Rojas

University of Northern Philippines

Vigan City, Ilocos Sur

[rojasrs@gmail.com](mailto:rojasrs@gmail.com) and [redentorsrojas@yahoo.com](mailto:redentorsrojas@yahoo.com)

**Abstract**

This study aimed to improvise a physical pendulum with sensor that can measure angular position and displacement, design and construct an instrumentation amplifier that could interface the sensor to a computer via a National Instrument NI USB-6009 data acquisition

device.

A nichrome wire was formed into a semi-circle loop. Using a carbon brush as a slider, a potentiometric sensor was formed which was then connected to a Wheatstone bridge of the instrumentation amplifier.

When the pendulum moves, the carbon brush attached to it slides over the nichrome wire thereby changing the effective resistance causing an imbalance in the Wheatstone bridge resulting to an output voltage.

Plotting the output voltage with the angular displacement in rad made it possible to calibrate the sensor to measure the angular position in terms of the output voltage.

### 35.11 **Frequency Optimization and Calibration of An Improved Rotational Variable Differential Transformer**

PPJ, Vol. 35 (2013), pp. 100-112

Redentor S. Rojas

University of Northern Philippines

Vigan City, Ilocos Sur

[rojasrs@gmail.com](mailto:rojasrs@gmail.com) and [redentorsrojas@yahoo.com](mailto:redentorsrojas@yahoo.com)

#### **Abstract**

This study aimed to improvise a rotational variable differential transformer (RVDT) and analyze its response to different excitation frequency coming from an electronic oscillator. This improvised apparatus can be used as a teaching material in physical electronics, instrumentation and experimental physics.

An oscillator was built based on a universal timer IC 555 wherein one of the resistors was replaced with a potentiometer to produce variable frequency. The oscillator can produce an output square wave with frequency ranging from 25Hz to 1kHz. The output of the oscillator was amplified by a power transistor 2N3055 which can provide current up to 5 A, to drive the primary coil of the RVDT. The oscillator was utilized basically to determine if the primary coil can resonate with a certain frequency. Resonant condition means maximum current on the primary coil.

Results showed that the primary coil did not resonate with a frequency anywhere from 25 Hz to 1kHz. The theoretical resonant current (when impedance,  $Z$  is equal to coil  $R$ ) of the coil at 6.45 V DC is 0.45 A,  $R$  of the coil is 13.0 ohms. When the excitation voltage is 6.22 V, 60 Hz from an ordinary step-down transformer the primary coil current is 0.26 A, comparable to the current when the excitation voltage comes from the oscillator. The improvised RVDT was calibrated using

an ordinary step-down transformer giving the following results.

When the input voltage is 3 volts and for the clockwise rotation, the voltage output changes at a rate of 0.2521 mV per degree while for the counter clockwise rotation, the voltage change is 0.2479 mV per degree. When the excitation voltage is 6 volts, the output voltage changes 0.5671 mV for every degree of clockwise rotation and 0.6138 mV for every degree of counter clockwise rotation. When the excitation voltage is 9 volts, the output voltage changes 0.8424 mV for every degree of clockwise rotation and 0.9224 mV for every degree of counter clockwise rotation

The results of t-test effectively set the effective range of the improved apparatus as follows: (a) for 3 volts input voltage, 5 – 45° clockwise rotation and 0 – 40° counter clockwise rotation; (b) for 6 volts input voltage, 10 – 45° clockwise rotation and 0 – 35° counter clockwise rotation; (c) for 9 volts input voltage, 0 – 35° clockwise and counter clockwise direction.

**35.12 Measurement of the Specific Heat of Sand Samples From Southern Leyte with A Self-Constructed Calorimeter**

PPJ, Vol. 35 (2013), pp. 113-122

Gerardo C. Maxino Ph D and Jon Assam M. Mascardo

Maxino College

Bagacay, Dumaguete City

**Abstract**

A calorimeter was constructed out of inexpensive readily available local materials. Tests conducted on the calorimeter with experiments on the latent heat of fusion yielded errors ranging from 0.625 % to 9.88 % with an average error of 4.47 %.

Sand samples were taken from all towns of Southern Leyte. The values of the specific heat ranged from 0.199 cal/g  $C^\circ$  to 0.254 cal/g  $C^\circ$ .

**35.13 34<sup>th</sup> Annual National Physics Seminar-Workshop Convention  
25<sup>th</sup> National Physics Olympics  
20<sup>th</sup> National Physics Fair**

April 12-15, 2012

Colegio De San Juan De Letran-Calamba

Calamba City, Laguna

Theme: "Physics, Nationalism, and Development"

578 Participants

## Philippine Physics Journal, Vol. 34 (2012)

34.01 **Revisiting Students' Early and Recurring Experiences and Perceptions about Physics**

PPJ, Vol. 34 (2012), pp. 1-9

Engr. Hadji Chua Alegre, MAT

Manila Tytana Colleges (formerly Manila Doctors College)

Pasay City

[hca\\_56\\_2005@yahoo.com](mailto:hca_56_2005@yahoo.com)

### **Abstract**

This descriptive research aimed at identifying students' early and recurring experiences and perceptions about Physics. It attempted to look into the experiences and perceptions of 100 BS Nursing sophomore students who were enrolled in Physics at Manila Tytana Colleges (formerly Manila Doctors College) during the second semester, AY 2009-2010. Journals written by the respondents based on pointers culled from a questionnaire were analyzed and discussed individually. Findings revealed that Physics is a real big frustration to students, but regarded as a challenge to them. Students confirmed that their achievements in Physics are very much affected by their attitudes and anxiety. Finally, results of the study indicated that teachers can relate with students and their predicament about Physics by employing relevant teaching strategies that established connections to their everyday life that made learning of Physics light, nice and easy.

34.02 **An Apparatus to Demonstrate the Principle of Equivalence**

PPJ, Vol. 34 (2012), pp. 10-15

Joel V. Lubrica, PhD<sup>1</sup> and Quantum Yuri B. Lubrica<sup>2</sup>

<sup>1</sup>Benguet State University

<sup>2</sup>University of the Philippines Baguio

[j.lubrica@mail.bsu.edu.ph](mailto:j.lubrica@mail.bsu.edu.ph)

### **Abstract**

This paper presents an apparatus to demonstrate the Principle of Equivalence, which states that gravitational effects are the same as, or



cannot be distinguished from, the effects of acceleration.

**34.03 Climate Literacy Among College Students: An Analysis**

PPJ, Vol. 34 (2012), pp. 16-22

Mario P. Obrero and Mariquit M. Obrero

University of Northern Philippines

Vigan City, Ilocos Sur

**Abstract**

This study was conducted to examine college students' climate literacy and its relationship to the students' characteristics, namely, gender, age, place of residence, year level, high school graduated from, self-assessed general level of awareness on climate change, level of energy use and number of one-way trips to school per week.

A Climate Literacy Questionnaire was administered to 99 students. The instrument measured their levels of knowledge on global warming, causes of climate change and actions to slow down climate change.

Results show that the students had a high overall level of climate literacy, and a high level of knowledge on global warming, a very high level on the causes of climate change, and a high level on the actions to slow down climate change. Significant differences in the literacy levels were obtained between and among subgroups according to year level and age. Further, regression analysis results indicate that year level is the best predictor of climate literacy.

It is concluded that college students are knowledgeable about global warming, causes of climate change and actions to reduce climate change. Future work may be done to determine the extent to which college students contribute in controlling climate change.

**34.04 A Survey on Environmental Issues Among University Students**

PPJ, Vol. 34 (2012), pp. 23-26

Marites C. Geronimo

Philippine Normal University

Alicia, Isabela

**34.05 Graph Interpretation Skills in Kinematics: A Study Among Second Year Engineering Students**

PPJ, Vol. 34 (2012), pp. 27-32

Erwin F. Cadorna, Ph.D. and Edelyn Alicar-Cadorna, Ph.D.

### Abstract

This paper reports a study of the skills in interpreting kinematics graph among the engineering students in the University of Northern Philippines, Tamag, Vigan City. The students had finished the general physics courses. Kinematics graphs were focused on x-t, v-t, and a-t graphs. This study made use of the exploratory type of research. The students completed a written instrument, the Test of Understanding Graphs-Kinematics (TUKG-K), adopted from Beichner (1996). The influence of students' personal variables and mathematics grades on graphical interpretation skills were likewise looked into in the study.

Findings show that, generally, the engineering students under study only had an average skill in interpreting kinematics graphs. They were found to have a moderate skill in interpreting v-t graphs and a-t graphs but high skills in interpreting x-t graphs. Moreover, they were skillful in finding the velocity given the x-t graph but not skillful in finding the acceleration and distance, given the v-t graph. Likewise, they were not skillful in finding the change in velocity, given the a-t graph; in identifying the corresponding graph, given the text explanation of the graph.

### 34.06 An Investigation on the Morphology of Spin-Coated YSZ Thin Film in Silica Substrate

PPJ, Vol. 34 (2012), pp. 33-39

Shirley Tiong Palisoc<sup>1</sup>, Rose Ann Tegio<sup>2</sup>, Michelle Natividad<sup>3</sup> and Simon Gerard Mendiola<sup>4</sup>

Materials Science Laboratory, Physics Department

De La Salle University, 2401 Taft Ave., Manila, Philippines

\*<sup>1</sup> [shirley.palisoc@dlsu.edu.ph](mailto:shirley.palisoc@dlsu.edu.ph)

<sup>2</sup> [roseann\\_tegio@yahoo.com](mailto:roseann_tegio@yahoo.com)

<sup>3</sup> [michelle.natividad@dlsu.edu.ph](mailto:michelle.natividad@dlsu.edu.ph)

<sup>4</sup> [sg\\_mendiola@yahoo.com](mailto:sg_mendiola@yahoo.com)

[\*Corresponding Author

E-mail address: [shirley.palisoc@dlsu.edu.ph](mailto:shirley.palisoc@dlsu.edu.ph)

Physics Department, De La Salle University, 2401 Taft Ave.,  
Manila, Philippines

Tel. no. +632-536-02-29]

### Abstract

Different concentrations of yttria stabilized zirconia (YSZ) grown on silica (SiO<sub>2</sub>) substrate were investigated in this paper. Suspension containing 10wt%, 30wt% and 50wt% YSZ were fabricated using the

spin coating technique on silica keeping all other parameters constant such as the coating parameters and sintering temperature. The surface morphology and thickness of the films were investigated using scanning electron microscopy (SEM). Results showed porous YSZ films which become less porous as the concentration of YSZ increases. The thickness of the films was also affected by the YSZ concentration. As the concentration increases, the thickness of the films also increases. The crystal structure of the fabricated films as also determined using X-ray Diffraction (XRD) and Raman Spectroscopy. Both techniques revealed a cubic fluorite structure independent of the concentration of YSZ.

**34.07 Statistical Analysis and Curve Estimation of Climate Variability in the Ilocos Provinces**

PPJ, Vol. 34 (2012), pp. 40-49

Mario P. Obrero adn Mariquit M. Obrero

University of Northern Philippines

Vigan City, Ilocos Sur

**Abstract**

This study aimed at analyzing climate in Ilocos Sur and Norte based on the two provinces' respective profiles on mean temperature, mean rainfall, mean relative humidity and mean sea level pressure. Descriptive and inferential statistics including curve estimation technique were used in the analysis of the recorded monthly data for the years 2007-2009 obtained from PAGASA Provincial Substations. Results show that the obtained data on mean temperature, mean rainfall and mean sea level pressure of Ilocos Norte were more variable than those of Ilocos Sur. In terms of mean relative humidity, Ilocos Sur had greater variability than Ilocos Norte. However, the differences in the climate data of the two provinces were not statistically significant. Results also revealed increasing trends in mean temperature, mean rainfall, mean relative humidity and mean sea level pressure in Ilocos Norte. The same patterns were observed in Ilocos Sure except on mean temperature and sea level pressure in which the trends are decreasing.

**34.08 Low-Cost Venturi Meter: Understanding Bernoulli's Equation Through a Demonstration**

PPJ, Vol. 34 (2012), pp. 50-57

Renan P. Limjuco<sup>1</sup>, Fr. Francisco G. Glover<sup>2</sup>, and Isagani M. Mendez<sup>1</sup>

<sup>1</sup> University of the Immaculate Conception

<sup>2</sup> Ateneo de Davao University

### **Abstract**

This study intended to concretize Bernoulli's principle through a low-cost Venturi meter designed and constructed by the researchers. Specifically, this paper aimed to improvise a device that can measure flow speeds of water both in the wide and narrow portions of a horizontal piping system for which the pressure difference is provided by a differential height revealed in the attached manometer. A mechanism which regulates volume flow rate of liquid was attached to Venturi meter to generate several trials required to establish accuracy of setup in demonstrating Bernoulli's principle.

This investigation about improvisation of apparatus required experimental development method especially in assembling various components which included PVC pipe, aluminum pipe, manometer, DC pump, variable flow controller, and a plastic container as water reservoir. The final model of the apparatus evolved from a series of functionality test sessions with experts and consultants. To determine the accuracy of the instrument, nine trials – that is three each for the three adjusted flow rates – were performed.

Findings revealed that the improvised Venturi meter can concretize Bernoulli's principle. Its accuracy in flow speed determination was high since average percentage of error for minor turbulent flow was 12.52 percent while that for laminar was 3.86 percent.

### **34.09 Spatial Ability and Physics Performance of College Students in Abra Valley Colleges**

PPJ, Vol. 34 (2012), pp. 58-73

Jacquelyn O. Mirasol, MST Physics

Science Research Assistant, Philippine Science High School - Ilocos Region Campus

Former College Instructor, Abra Valley Colleges, Bangued, Abra

[eikcajmirasol@yahoo.com](mailto:eikcajmirasol@yahoo.com)

### **34.10 Forecasting Power Load Demand Using Holt-Winters Model**

PPJ, Vol. 34 (2012), pp. 74-84

<sup>1</sup> Alfeo B. Tulang and <sup>2</sup> Alwielland Q. Bello

<sup>1</sup> Mathematics Department Bukidnon State University Malaybalay City

<sup>2</sup> Natural Sciences Department Bukidnon State University Malaybalay City

<sup>1</sup> [abtulang@gmail.com](mailto:abtulang@gmail.com)

<sup>2</sup> [alwielland@gmail.com](mailto:alwielland@gmail.com)

### **Abstract**

Virtually time series observations such as power load demand follow some seasonal patterns. Electric service utilities depend on most quantitative forecasting models. This paper presents forecasting procedure using the Holt-Winters exponential smoothing model. Since data were stochastic and assumed to follow a multiplicative seasonality, this study adopts the classical decomposition method in the analysis of seasonal data. Decomposition is an approach of separating the time series into its component parts. The components of the Holt-Winters model include the level, trend, the seasonal index, and randomness with some smoothing constants which are estimated. Power load demand data are categorized as commercial, residential, industrial or others, from a given area of a power utility. The purpose of this study is to develop long-term forecasts of the power load demand in Cagayan de Oro City as well as to promote the use of Holt-Winters model as a time series forecasting method. With some numerical results, the Holt-Winters model predicts the patterns of power demand over a given time interval.

#### **34.10 Health and Radiation: An Insight from Fukushima Nuclear Disaster**

PPJ, Vol. 34 (2012), pp. 85-90

Loreto B. Feril, Jr.<sup>1</sup>, Dave F. Bargamento<sup>2</sup>, Kazuki Yamaguchi<sup>3</sup>, Ryohhei Ogawa<sup>3</sup>, Zheng-Guo Cui<sup>3</sup>, Yoshiaki Tabuchi<sup>3</sup>, Yukihiro Furusawa<sup>3</sup>, Takashi Kondo<sup>3</sup> and Katsuro Tachibana<sup>1</sup>

<sup>1</sup> Fukuoka University School of Medicine, Fukuoka City, Japan

<sup>2</sup> National Nutrition Council 7, Department of Health-Center for Health Developmen, Cebu City, Philippines

<sup>3</sup> Toyama University Graduate School of Medicine and Pharmaceutical Sciences, University of Toyama, Toyama City, Japan

[ferilism@yahoo.com](mailto:ferilism@yahoo.com)

#### **34.11 Seawater Salinity in Siquijor Island, Philippines**

PPJ, Vol. 34 (2012), pp. 91-97

Gerardo C. Maxino, Ph D and Edlyn O. Sanchez, BS Physics  
Climate Studies Center

Maxino College

Dumaguete City

**Abstract**

Seawater salinity was measured in eastern, western, and southern Siquijor Island using two methods: boiling and conductivity measurement. The results of the two methods are in close agreement with each other.

34.12 **33<sup>rd</sup> National Physics Seminar-Workshop Convention**

**24<sup>th</sup> National Physics Olympics**

**19<sup>th</sup> National Physics Fair**

April 6-9, 2011

Silliman University

Dumaguete City, Negros Oriental

Theme: "Physics and Environmental Well-Being"

285 Participants

34.13 **Seminar-Workshop for Science Educators**

**Philippine Physics Society and**

**Notre Dame University**

September 23-24, 2011

College of Arts and Sciences

Natural Sciences Department

Cotabato City

Theme: "Science Educators: Responding to Current Trends and Challenges"

57 Participants

34.13 **PPS MARCH**

## **Philippine Physics Journal, Vol. 33 (2011)**

33.01 **Biohydrogen Fuel Yield of Thermophilic Heat Pretreated Mixed Inoculum from Sugarcane Mill Wastewater**

PPJ, Vol. 33 (2011), pp. 1-10

Emmanuel P. Leño<sup>a,b</sup> and Alwielland Q. Bello<sup>c</sup>

<sup>a</sup> School of Biochemical Engineering and Technology, Sirindhorn International Institute of Technology (SIIT), Thammasat University,

P.O Box 22, Pathumthani 12121, Thailand

<sup>b</sup> Central Mindanao University,  
University Town, Musuan, 8710 Maramag,  
Bukidnon, Philippines

<sup>c</sup> Bukidnon State University  
Fortich Street, 8700 Malaybalay City,  
Bukidnon, Philippines

### **Abstract**

Various pretreatment methods including heat have been conducted on the mixed inoculums to enrich hydrogen producing bacteria (HPB). This study investigated the use of heat as pretreatment method for the anaerobic sludge at 105°C ranging from 45,60,90 and 120 minutes to determine the optimum time to suppress methanogenic activity and enhance hydrogen production using artificial wastewater. Optimum time of heating the inoculum obtained from the experiment was applied to the sugar mill wastewater as substrate. Sugarcane mill wastewater was also diluted 50% to see the effect on H<sub>2</sub> production. Results of batch experiments showed that the heat treatment at 105°C regardless of time duration of heating showed no activity for methanogenic bacteria. There is an increasing trend of hydrogen production with the increase in heating time at 105°C regardless of sucrose loading (10g/L and 20g/L) with the highest value recorded at 120 minutes (3.24 mol H<sub>2</sub>/COD for 10g/L and 4.26 mol H<sub>2</sub>/gCOD for 20g/L). Results for sugarcane mill wastewater revealed an increasing trend of H<sub>2</sub> production with the highest value of 2.38 mol H<sub>2</sub>/gCOD observed for 100% substrate loading (without dilution) and 1.75 mol H<sub>2</sub>/gCOD for 50% dilution indicating a suitable source for clean energy production.

### **33.02 Development and Utilization of an Experimental Resonance Tube Setup with Laptop-Generated Sound Source**

PPJ, Vol. 33 (2011), pp. 11-16

Alwielland Q. Bello  
Bukidnon State University  
Fortich Street, 8700 Malaybalay City,  
Bukidnon, Philippines

### **Abstract**

An experiment resonance tube setup consisting of an economy resonance tube, laptop computer, desktop speaker and digital thermometer was developed and utilized inside the physics classroom in the Bukidnon State University, Malaybalay City, Bukidnon. The experiment

values of speed of sound  $v_{sound}$  at room temperature were deduced through frequency-vs-harmonic number ( $f$ -vs- $n$ ) experiments. These experiments include open-pipe and stoped-pipe procedures in several trials. Room temperature has been found changing at different time intervals of the day and weather conditions so that frequency-vs-harmonic number ( $f$ -vs- $n$ ) were performed at different room temperatures at different time intervals.

### 33.03 **Alternative Conceptions in Force and Gravity: Differences Between Secondary and Tertiary Students**

PPJ, Vol. 33 (2011), pp. 17-32

Erwin F. Cadorna, Ph.D and Edelyn Alicar-Cadorna, Ph.D

#### **Abstract**

This paper reports a study of the alternative conceptions held by secondary and tertiary students with focus on the total force on a ball thrown vertically, forces on a ball thrown along a parabolic path, and gravity when in orbit around the earth. This Study made use of the exploratory type of research. The students completed a written instrument which probed their understanding of force and gravity. Analysis was given emphasis on the reasons given by the students in support to their answer.

Findings reveal that the students have quite serious misunderstanding about the concept of force and gravity. Generally, the secondary students and the tertiary students have more less the same belief that force is in the direction of motion; that if a ball is moving upward, there must be a continuous force acting in that direction; that the force of throw remains on the ball until it reaches the highest point of its flight; and that anything which is at rest does not experience any force. Moreover, they also believe that there is no gravitational force acting on freely falling object, and there is no gravity on the moon. There is, however, a greater proportion of secondary students who have these misconceptions. Moreover, differences lie between the secondary and the tertiary students on the reasons they provide in support to their answers. The secondary students gave more inconsistent reasons than the tertiary students: anything which is at rest does not experience any force. Moreover, they also believe that there is no gravitational force acting on freely falling object, and there is no gravity on the moon. There is however, a greater proportion of secondary students who have these misconceptions. Moreover, differences lie between the secondary and the tertiary students on the reasons they provide in support to their answers.



The secondary students gave more inconsistent reasons than the tertiary students.

**33.04 Teaching Understanding in Physics**

PPJ, Vol. 33 (2011), pp. 33-40

Eng. Philip P. Carpina

Bacolod Tay Tung High School, Bacolod City

**33.05 Some Techniques of Solving for the Acceleration of an Atwood's Machine**

PPJ, Vol. 33 (2011), pp. 41-46

Joel V. Lubrica, Ph.D

Benguet State University, La Trinidad Benguet

[j.lubrica@mail.bsu.edu.ph](mailto:j.lubrica@mail.bsu.edu.ph)

**Abstract**

This paper presents two approaches of solving for the acceleration of an Atwood's machine. These are along Newtonian mechanics and Lagrangian mechanics. For the former, three techniques are offered: direct application of Newton's law of acceleration; Gaussian elimination; and, the use of determinants.

**33.06 Scientific Reasoning Ability and Physics Performance of the Scholars of the Philippine Science High School-Ilocos Region Campus**

PPJ, Vol. 33 (2011), pp.47-60

Sharon L. Palamares, MST Physics

SST-Physics, PSHS-IRC

**33.07 College Physics Learning Environment: Its Influence on Student's Attitudes and Academic Efficacy**

PPJ, Vol.33 (2011), pp.61-67

Mario P. Obrero, Ph.D

University of Northern Philippines, Vigan City, Ilocos Sur

**Abstract**

This study was conducted to investigate the influence of learning environment on college student's attitudes towards learning physics and academic efficacy. Results revealed that the student's learning environments are very satisfactory in almost all dimensions. The student's

attitudes are moderately favorable in four dimensions, namely: personal, interest, problem solving (general), problem solving confidence, and sense-making/effort. The students had very satisfactory overall learning environment and a moderate favorable overall attitude and academic efficacy. Significant positive correlations exist between learning environment, and attitude towards learning physics and academic efficacy. College physics students should be exposed to learning environments which promote positive attitudes towards the subject and enhance academic efficacy. Instructional tasks should be varied, creative, interesting, interactive, and relevant to the real world.

**33.07 Student's Attitudes Towards Physics at Siquijor State College: A Study Report**

PPJ. Vol. 33 (2011), pp. 68-77

Roel D. Taroc, Ph.D

Director of Maritime Education Program,

Siquijor State College, Old Capitol Circle, North Poblacion, 622 Larena, Siquijor

[wingroe@yahoo.com](mailto:wingroe@yahoo.com)

**Abstract**

This study aimed at investigating the student's attitude towards Physics particularly on teaching strategies, concepts, laboratory apparatus/equipment, outputs and assignments at Siquijor State College. The descriptive survey method was used in the research process.

**33.08 Thermal Radiation Properties of Locally Available Construction Materials**

PPJ. Vol. 33 (2011), pp 78-85

Hope M. Badal, Ph.D. and Mary Ann Cruz

Physics Department, Silliman University

This article reports the results of a study done on thermal radiation properties of locally available construction materials using a radiation cube and a corresponding radiation sensor. The study's findings includes results on (a) the thermal radiation intensity associated with each material (b) the percentage of thermal radiation that each material is able to block, and (c) relative measures of the emissivity of materials, obtained by comparing the slopes of the sensor readings vs.  $T^4$  graphs for the different samples.

**33.09 Creation of Temperature and Rainfall Profiles for Bagacay, Dumaguete City and Maloh, Siaton, Negros Oriental**

PPJ. Vol. 33 (2011), pp. 86-92

R.G Tubog and C.C Maxino

Climate Studies Center, Maxino College, Central Bagacay, Dumaguete City

**Abstract**

This study was conducted to address the scarcity of climate data in the Philippines. Temperature and rainfall data were gathered for a period of six months (July-December, 2010), for two sites in Negros Oriental: Bagacay, Dumaguete City and Maloh, Siaton. Simple, inexpensive methods were used in the measurement of temperature and rainfall. Comparisons with data from PAGASA's meteorological observation station in Dumaguete City, showed that the temperature profiles obtained for the sites were similar to that of PAGASA's, while only the rainfall profile of Bagacay was similar to PAGASA's. The results further show that the measurement methods used in the study produce data comparable to data gathered by PAGASA.

**33.10 List of Participants**

32<sup>nd</sup> Annual National Physics Seminar-Workshop Convention

23<sup>rd</sup> National Physics Olympics

18<sup>th</sup> National Physics Fair

April 7-10, 2010

Xavier University

(Ateneo de Cagayan)

Theme: "Physics and Climate Change"

247 Participants

93 Schools/Institutions

From Luzon, Visayas, Mindanao

**33.11 PPS MARCH**

**Philippine Physics Journal, Vol. 32 (2010)**

**32.01 Fabrication and Characterization of Melt Quenched Lead-Doped BSCCO Superconducting Ceramics**

PPJ, Vol. 32 (2010), pp.1-9

Shirley Tiong-Palisoc, Ph.D  
De La Salle University, Manila

**32.02 Peer Instruction: Its Effect on Conceptual Understanding and Confidence of Engineering Students Taking Calculus-Based Introductory Physics**

PPJ, Vol. 32 (2010), pp. 10-23

Bobby D. Manlapig, Darwin L. Saludez and Fe Novida and May Lozada  
Physics Department, Mapua Institution of Technology Intramuros Manila

**Abstract**

This study focused on the effect of Peer Institution (PI) in the conceptual understanding and confidence level of engineering students taking up calculus-based introductory physics. The method was highlighted with the use of conceptual questions called ConcepTest that were posed on the class after discussing central points in a topic. Each students explained the correctness of his answer on each ConcepTest with a partner. The students also gave their confidence level on their answer before and after PI. The scores of students in the experimental and the control group on pretest both showed that there was a significant ( $p < 0.05$ ) increase in their conceptual understanding. However the results also showed that the increase in conceptual understanding of the students in the experimental group was significantly higher than that of the students in the control group. On the other hand, the results also showed that there was a significant increase in the students' confidence level towards their answer on each ConcepTest posed on them.

**32.03 Benefits from the Use of the Demonstration Strategy in Teaching Physics**

PPJ, Vol. 32 (2010), pp. 24-29

Joel V. Lubrica, Ph.D

Benguet State University, La Trinidad, Benguet

[jlubrica@yahoo.com](mailto:jlubrica@yahoo.com)

**Abstract**

This study investigated responses of 21 fourth year Bachelor of Secondary Education (major in physical science) students on the use of demonstration strategy in their physics classes. Specifically, it considered a) the appropriateness of the strategy; b) the frequency of utilization of this strategy by their own physics teachers; c) the extent to which certain teacher characteristics are shown when strategy is used;

and, d) the extent to which certain student behaviors are elicited when the strategy is utilized. Data collection was through a questionnaire. Statistical treatment involved arithmetic means based on the assumption that the Likert-type data obtained can be considered as interval in nature. Results show that: a) all the respondents considered the strategy as appropriate for their physics lessons and thought that it should be used more frequently by their teachers; b) when a physics teacher used the demonstration strategy, this utilization showed *very greatly* that their physics teacher had, among other characteristics, mastery of subject matter, wanted to make the classroom environment more conducive to learning, and recognized that the students were diverse; c) the use of the strategy by their physics teachers *very greatly* motivated students to get higher grades and to learn more about physics, stimulated them to ask more 'Why' and 'How' questions, and inspired them to become more independent learners and to become teachers of physics in the future, among others.

**32.04 Parallel Plate Capacitor**

PPJ, Vol. 32 (2010), pp. 30-32

Raymund S. Vizcarra, CE, MSc, Ph.D (cand) and Fr. Francisco Glover, S.J., Ph.D

Physics Department, Ateneo de Davao University,  
Jacinto St., Davao City

**32.05 Dielectric Constant of Water**

PPJ, Vol. 32 (2010), pp. 33

Raymund S. Vizcarra, CE, MSc, Ph.D (cand) and Fr. Francisco Glover, S.J., Ph.D

Physics Department, Ateneo de Davao University,  
Jacinto St., Davao City

**32.06 Half-Century of Physics in Central Visayas: A Remembrance**

PPJ, Vol.32 (2010), pp. 34-39

Gerardo C. Maxino, Ph.D

Maxino College

Dumaguete City 6200

**Abstract**

A participant-observer reminisces about the beginnings and ups and downs of physics education in Central Visayas, as well as assesses its

current status and challenges. This brief historical account pinpoints the real force and strength and core elements that sustained the development of physics and physics in the region and other parts of the country the region has been able to serve.

### 32.07 **Design and Construction of an Inexpensive Basic Sonometer**

PPJ, Vol. 32 (2010), pp 40-46

Hope Maxino Bandal, Ph.D and Kenny P. Vargaño

Silliman University, Dumaguete City

#### **Abstract**

A basic sonometer is constructed using locally-available material. Total material cost is only about one thousand pesos. Labor cost were minimal. Soldering of metal parts and shaping of the wooden parts were done at the Physics shop of the Physics Department of Silliman University.

Preliminary experiments were conducted to test the reliability of the sonometer as means of determining the fundamental frequencies of vibrating strings. Percentage errors in the frequency values ranging from less than 1% to just a little greater than 10% for the different wire and string samples were obtained but mostly at the lower percentage error end. Four kinds of materials were used as strings and wire, namely coralon string (a black, relatively heavy string used in the making of nets), nylon string, iron wire, and copper wire.

Aside from using the constructed sonometer to obtain the fundamental frequency values of the wires and strings, this was also used to obtain the linear density values of the samples wires with relatively good results for the iron wires.

### 32.08 **Therapeutic High Intensity Focused Ultrasound**

PPJ, Vol. 32 (2010), pp 47-52

Loreto B. Feril, Jr., M.D., Ph.D.<sup>a,\*</sup>, Katsuro Tachibana, M.D., Ph.D.<sup>a</sup> and Takashi Kondo Ph.D.<sup>b</sup>.

<sup>a</sup> Department of Anatomy, Fukuoka University School of Medicine  
7-45-1 Nanakuma, Jonan Fukuoka 814-0180, Japan;

<sup>b</sup> Department of Radiological Sciences, Graduate School of Medicine and Pharmaceutical Science, University of Toyoma,  
Toyoma 930-0194, Japan

Corresponding author: [ferilism@yahoo.com](mailto:ferilism@yahoo.com)

#### **Abstract**

Medical use of ultrasound is rapidly advancing not only in medical imaging or sonography but also in the use of ultrasound for therapeutic benefit. Several studies at different levels are currently underway and the clinical use of high intensity focused ultrasound (HIFU) in an increasing number of medical conditions such as prostate tumors, abdominal tumors, atrial fibrillations, vascular conditions, and many others is highlighting the significant advances in this field. Rapidly rising number of research works on this area in recent years may help us foresee a future with ultrasound, particularly HIF, playing a major role in the field of medicine.

### 32.09 **ZnTe-Zn(S,Te) Superlattices**

PPJ, Vol. 32 (2010), pp. 53-58

<sup>a</sup>S.Tiong-Palisoc, <sup>b</sup>M.Korn, and <sup>b</sup>W.Faschinger

<sup>a</sup>Physics Department, De La Salle University, Manila, Philippines

<sup>b</sup>Physikalisches Institut, Universitaet, Wuezburg, Germany

#### **Abstract**

ZnTe-Zn(S,Te) short-period superlattices were grown on (001) GaAs substrates with very good structural quality. The growth conditions were found to be quite reproducible, leading to series of samples with periods between 12 Å and 29 Å. Characterization of the samples with high resolution x-ray diffraction confirmed high structural quality showing that all samples were pseudomorphically grown. The relaxation behavior was strongly influenced by the ZnTe well-width with two critical observed ZnTe-thicknesses.

### 32.10 **Conceptual Change in an Active Learning Environment**

PPJ, Vol. 32 (2010), pp. 59-64

Theresa O. Corcoro, Ph.D

Natural Science-Mathematics Department, College of Arts and Science-  
Norte Dame University,

Notre Dame Avenue, Cotabato City, Philippines

The study aimed to investigate the effect of Active Learning in the conceptual understanding of physics by college students. Specifically, it aimed to determine the level of conceptual understanding and level of confidence of the students exposed to Active Learning prior to and after the instructions. It further determined the types of conceptual changes in students exposed to Active Learning. Furthermore, it aimed to determine the students' conceptions on Electricity prior and after Active

Learning instruction and the students' views on Active Learning.

The study used a descriptive research design. It involved one section of engineering students at Notre Dame University, Cotabato City. A 21-item open-ended multiple choice Conceptual Test n Electricity, a 26-item Questionnaire on Students' Views on Active Learning , unstructured interview aand journal entries were utilized to gather the data that were subjected to qualitative and quantitative analysis. The findings of the study revealed that generally, Active Learning is effective in increasing the level of conceptual understanding of college physics students specifically improving thier semantic conceptual understanding. The study also revealed that, students have positive views towards the use of Active Learning in the classroom. Active Learning has developed in them independent thingking, a sense of responsibility in their learning, allowed them to actively participate in class and to share their own idea.

### 32.11 **Understanding Satellite Motion**

PPJ, Vol. 32 (2010), pp. 65-68

Vicente Simplicio M. Villegas

Samar State University, Catbalogan City, Western Samar

#### **Abstract**

A demonstration activity can be designed to show how orbiting motion may effect the concept of "steady-state" motion and eventually resolve the understanding that orbiting motion of satellites subsumes its spinning motion when observed from a reference point external to the moving system.

As for steady-state observation of statellites, bodies representing statellite and earth are marked. Orbit and spin motions of statellite and earth require the same time to complete respective motion. Observations from marked bodies are taken. Results will approximate steady-state.

As for the demonstration as to how statellites can exhibit spin motion while orbiting a central body without spinning in place while in orbit motion, bodies representing moonn and earth are respectively marked. Satellite orbits earth with one side facing earth at all times. Design a marker with two opposite sides to represent rigid axis of moon. As moon orbits, lunar axis mark stays put overhead moon body with respect to external reference point. Observed orientation of moon with respect to axis marker at four (4) strategic points in the oval path. Results will show spinning motion of the orbiting body.



## Philippine Physics Journal, Vol. 31 (2009)

### 31.01 Gene Transfection Through Microbubble-Aided Sonication in Cancer Cells

PPJ, Vol. 31 (2009), pp. 1-7

Dickerson C. Moreno, Ph.D.<sup>a</sup>, Loreto B. Feril, Jr., M.D., Ph.D.<sup>b,\*</sup>, Katsuro Tachibana, M.D., Ph.D.<sup>b</sup>, and Yutaka Irie, M.D.<sup>b</sup>

<sup>a</sup>Physics Department, De La Salle University, Manila, Philippines

<sup>b</sup>Department of Anatomy, Fukuoka University School of Medicine, Fukuoka, Japan

Corresponding author: [ferilism@yahoo.com](mailto:ferilism@yahoo.com)

#### Abstract

**Objective:** To determine the effects on transfection rate of microbubble-aided ultrasound-mediated gene transfection (sonotransfection) of various sonication

**Methods:** Two cancer cell lines were used, namely HeLa and U937. Enhanced green fluorescent protein (eGFP) genes and microbubbles were added into the cell cultures right before sonication. The sonication parameters were varied with respect to burst frequency, intensity and sonication time. Each cell line was assayed initially with the fluorescent microscopy and then with the flow cytometry for a more accurate transfection rate determination.

**Results and Discussion:** The results show significant transfection rate differences between the unsonicated and the sonicated samples. The transfection rates of both cell lines varied with sonication time, burst frequency and intensity. These results may help optimize sonotransfection in line with its potential application for cancer gene therapy.

### 31.02 Educators' Perspectives of the Government Funded Science Education Program in the Philippines 2007 Master in Physics: A Dramaturgical IDI

PPJ, Vol. 31 (2009), pp. 8-18

Rene B. Cabrera

University of San Carlos, Cebu City

## **Abstract**

This study is entitled Educators Perspectives of the Government Fuded Science Education Program in the Philippines 2007 Master in Physics: A Dramaturgical In-Depth-Interview. The general objective of this study is to make an initial qualitative curriculum assessment and evaluation. Specifically it intends to address the following objectives: (1) To draw out perspective from the educators in the implementation of the Master in Physics (MP), (2) To contextually analyze the derived perspective drawn from the respondents in promoting better curriculum addressed to solve or minimize the present education problems related to program quality, and (3) To present insights which may be needed for the MP Curriculum Evaluation, Assesment and Monitoring for its improvement. In so doing, this research endeavors to provide answers to the following questions: How was the MP program originally conceived in terms of its goals to be amcomplished? How are the goals accomplished? What insights were observed that make the program succesful? What major MP curriculum problems did the educators encounter and are these problems resolved?

This research uses *dramaturgical in-depth interview*- a technique popularized by a sociologist Erving Goffman in the early 1960s in drawing out the perspective of the respondents on the implementation of the MAP program. The dramaturgical orientation in this study is similar in some ways to what Douglas (1985) initiated in terms of creative interviewing. This study creating an appropriate climate for informal exchanges and for mutual disclosures. The approach used was a kind of standardized interview with mostly open-ended questions in a scheduled form, although unscheduled ones were also applied in probing especially when the interview questions seemed unclear to the respondents. Some of the constructed interview questions also seem to be double-barreled (a limitationof this qualitative study with a novice reseacher) but were clarified in the conduct of the interview .This query was conducted using a structured interview process where three among the five faculty members handling the major MP courses were individually interviewed in a closed room in about one hour duration. The remaining two faculty members were excluded in the interview to minimized biases because they were major reseachers of this study.

### **31.03 Self Description and Academic Perfomance in Physics and Mathematics**

PPJ, Vol. 31 (2009), pp. 19-22

Josephine Caridad S. Borje, Bretel B. Dolipas, Jennifer Lyn S. Ramos  
Benguet State University, La Trinidad, Benguet

**Abstract**

This study aimed to determine the association between the self-description factors to academic performance in mathematics and physics of students enrolled in Bachelor of Science in Information Technology (BSIT) and Bachelor of Science in Applied Statistics (BSAS) courses. The result of the research could be used to improve the performance of students in mathematics and physics.

The finding shows that self-description on mathematical ability, problem solving ability, and on the same sex peer relations were highly associated with the achievement in mathematics of Bachelor of Science in Applied Statistics students and Bachelor of Science in Information Technology students. The overall self-description of BSIT and BSAS students were associated to their mathematical performance.

**31.04 Simplified Automatic Timer Device for PC and Stopwatch**

PPJ, Vol. 31 (2009), pp. 23-29

Francisco S. Sanchez

Bataan Peninsula State University, Balanga Campus,

City of Balanga 2100

Email: [pensanchez1229@yahoo.com](mailto:pensanchez1229@yahoo.com)

Cell: 09176152379

**31.05 Density Functional Theory Investigation on the Adhesion of Epoxy Ortho-Cresol Novolac Monomer to Aluminum**

PPJ, Vol. 31 (2009), pp. 30-34

A.A. Padama<sup>a,b</sup>, A.R. Villagrancia<sup>b</sup>, N. Arboleda<sup>b</sup>, R.Pobre<sup>b</sup>, and R.Quiroga<sup>b</sup>

<sup>a</sup>Philippine Normal University, Manila

<sup>b</sup>Physics Department, CENSER, De La Salle University, Manila

The adhesion strength of epoxy ortho-cresol novolac (EOCN) resin monomer to aluminum atm was calculated using Density.

**31.06 Various Pulley Systems**

PPJ, Vol. 31 (2009), pp. 35-42

Joel V. Lubrica, PhD

Benguet State University

La Trinidad, Benguet

[jlubrica@yahoo.com](mailto:jlubrica@yahoo.com)

### **Abstract**

The construction or assembly of four pulley systems, utilizing a total of three double pulleys and three single pulleys, is presented in this paper. Activities to show Ideal Mechanical Advantage (IMA) and Actual Mechanical Advantage (AMA) are described. From computations of IMA and AMA, the efficiency of a system can be calculated.

#### **31.07 Movie Scenes as Valid Simulations of Selected Fundamental Physics Concepts**

PPJ, Vol. 31 (2009), pp. 43-46

Dr. Renan Preyas Limjuco

Ateneo de Davao University

Jacinto Street, Davao City

and

University of the Immaculate Conception

Fr. Selga St., Davao City

#### **31.08 Physics in Resources Recycling: Jig Separation of Plastics**

PPJ, Vol. 31 (2009), pp. 47-54

Richard D. Alorro, MEng\* and Masami Tsunekawa, Ph.D

Laboratory of Mineral Processing and Resources Recycling, Graduate of Engineering, Hokkaido University

Sapporo, Japan

\*Corresponding author: [richard@eng.hokudai.ac.jp](mailto:richard@eng.hokudai.ac.jp)

### **Abstract**

Recycling has gained attention nowadays due to the increasing awareness in sustainable development. The recycling of waste plastics has become one of the priorities because of the rising consumption and generation of plastic wastes from different sectors of the society. Waste plastics are composed of a mixture of different types of plastics and need to be separated before they can be recycled. Several techniques were investigated or developed to separate plastics and one of them is jig separation. Jig separation is based on the displacement of particles in a bed fluidized by the pulsation of the fluid in a vertical plane so as to produce stratification. The principles behind jiggling are governed by physics, particularly the motion of particles in fluid. This paper presents the theories proposed to effect particle separation by jiggling. Studies on the application of jiggling to separate different kinds of plastics were reviewed. It can be concluded that jig separation

can be applied for plastic separation and recycling. However, more research and development effort is required before a commercial scale application can be established.

**31.09 Viscosity of Chitosan from Squid Pen as Scar Remover**

PPJ, Vol. 31 (2009), pp. 55-59

Merlina A. Delorino<sup>a</sup> and Salvacion P. Cresidio, Ph.D<sup>b</sup>

<sup>a</sup> Arts and Sciences Department

Colegio de San Juan de Letran-Calamba

Laguna, Philippines

[babydelorino@yahoo.com](mailto:babydelorino@yahoo.com)

<sup>b</sup> Physical Sciences Department

Centro Escolar University

Mendiola, Manila, Philippines

[spcresidio@yahoo.com](mailto:spcresidio@yahoo.com)

**Abstract**

This study focuses in the investigation of chitosan from squid pen in the formulation of scar remover. One of the methods used in the characterization of prepared chitosan was done by determining its viscosity-average molecular weight (MV). This viscosity of the solution was determined using Brookfield viscometer and the average molecular weight was calculated using Mark-Houwink equation. The nanostructure of the prepared chitosan films were scanned using Olympus CK40 phase contrast microscope coupled with camera at 20x magnification. Preparation of chitosan films demonstrated significantly different viscosity and average molecular weight which is one of the important parameters which could influence the performance of chitosan as scar remover.

**31.10 AB Initio Investigation on Geometrically Optimized Dimer-Pyrrole and Aluminum Atom Interaction**

PPJ, Vol. 31 (2009), pp. 60-63

Al Rey Villagracia<sup>1</sup>, Allan Padama<sup>1</sup>, Romeric Pobre<sup>1</sup>, Enrique Manzano<sup>2</sup>, Ma. Carla Manzano<sup>1</sup> and Reuben Quiroga<sup>1</sup>

<sup>1</sup> Physics Department, CENSER, De La Salle University 1004

<sup>2</sup> Electronics and Communications Engineering Department, De La Salle University 1004

**31.11 Guided Inquiry Laboratory (GIL) in High School Physics**

PPJ, Vol. 31 (2009), pp. 64-75

Fely B. Buera  
Philippine Science High School-Bicol Region Campus  
Tagontong, Goa, Camarines Sur

**Abstract**

The main objective of this study was to determine the effectiveness of guided inquiry laboratory in enhancing the performance of students in Physics along conceptual understanding, high thinking skills, science process skills and attitudes.

The guided inquiry laboratory (GIL) used in this study focused on topics on free falling motion, law of acceleration and law of interaction. The students performed the laboratory activities in small cooperative groups. As the students were engaged in the guided inquiry laboratory activities they demonstrated their cognitive skills and science process skills at varying levels. Majority of them also demonstrated positive attitudes.

Guided inquiry laboratory (GIL) was effective in enhancing students' conceptual understanding and high thinking skills based on t-test results. It was also effective in enhancing the students' science process skills which include formulating hypothesis, designing experiment, presenting data, and interpreting data. Kruskal-Wallis test applied to scores obtained for these skills resulted to p-values of less than 0.05 except for laboratory skills in terms of concluding experiment and collecting data and in drawing of conclusions. Attitudes of students and the time constraints might have affected these results.

The guided inquiry laboratory (GIL) was effective in enhancing most of the attitudes explored on t-test results. The GIL improved students' attitudes concerning the challenging nature of Physics as a subject. It also enhanced their interest in learning concepts in Physics, their appreciation of independent learning process, their appreciation of active learning process, and value of curiosity, teamwork and laboratory work. Students also enjoyed learning Physics by guided inquiry laboratory.

**31.12 Synthesis and Property Optimization of Melt Quenched BPb-SCCO Superconductors**

PPJ, Vol. 31 (2009), pp. 76-80

Shirley T. Palisoc, Michelle T. Natividad and Phebe P. Mendoza

De La Salle University

Taft Avenue, Manila

**Abstract**

The melt quenched method was applied in the fabrication of  $\text{Bi}_{1.6}\text{Pb}_{0.4}\text{Sr}_2\text{Ca}_{n-1}\text{Cu}_n\text{O}_y$  superconducting ceramics with  $n = 2.0, 2.5, 3.0$  and  $3.5$ . The samples were prepared as determined by its stoichiometric composition by melting it at  $1080^\circ\text{C}$ . The melts were poured immediately onto a stainless steel plate and quenched to room temperature. The samples were ground, pelletized and annealed at a constant temperature of  $840^\circ\text{C}$  for 24 hours.  $T_c$  SEM and XRD measurements were made. XRD results showed the coexistence of the low  $T_c$ , high  $T_c$  and several non superconducting phases. An increase in Ca and Cu facilitate the growth of the high  $T_c$  phase.

**31.13 Conference-Workshop on Integrating Climate Change Concepts in Teaching the Sciences**

February 11, 2009

La Consolacion College – Bacolod

Bacolod City

40 Participants

**31.14 30<sup>th</sup> Annual National Physics Seminar-Workshop Convention  
21<sup>st</sup> National Physics Olympics**

**16<sup>th</sup> National Physics Fair**

PPS Jade Celebration

April 2-5, 2008

Siquijor State College

6226 Larena, Siquijor

Theme: "Physics and Magic, Mystics and Wizardry"

396 Participants

## **Philippine Physics Journal, Vol. 30 (2008)**

**30.01 Dual Role of Low-Dose Ionizing Radiation**

PPJ, Vol. 30 (2008), pp. 1-7

Mikhail A. Buldakov<sup>1,2</sup> and Loreto B. Feril, Jr.<sup>3</sup>

<sup>1</sup> Cancer Research Institute of Tomsk Scientific Center of Siberian Branch of Russian Academy of Medical Science, Tomsk, Russia

<sup>2</sup> Biological Institute, Tomsk State University, Tomsk, Russia

<sup>3</sup> Department of Anatomy, Fukuoka University School of Medicine, Fukuoka, Japan

### 30.02 **Experiment on Rectilinear Motion Using a PC**

PPJ, Vol. 30 (2008), pp. 9-19

Redentor S. Rojas

(rojasrs@gmail.com, redentorsrojas@yahoo.com)

University of Northern Philippines

Tamag, Vigan City

2700 Ilocos Sur

#### **Abstract**

This paper presents an experimental method of determining the magnitude of the acceleration of two bodies with different masses connected by string that passes through a pulley (an Atwood's machine).

The acceleration is determined by approximating the time interval for successive displacement of the masses and computing the speed,  $v$  for the given time interval,  $t$ . The slope of the  $v$  against  $t$  plot is the magnitude of the acceleration,  $a$ .

The time interval is determined by analyzing the signal from the improvised sensors.

### 30.03 **Student Evaluation of Teaching: Are Physics Instructors Different From Instructors of Allied Subjects?\***

PPJ, Vol. 30 (2008), pp. 20-36

Maria Azucena B. Lubrica, Ph.D. and Joel V. Lubrica, Ph.D.

Benguet State University

\*based on a paper presented by the authors at the Annual National Conference of the Philippine Physics Society, April 8-12, 2006, Aklan, Philippines

#### **Abstract**

Responses of students to a 24-item Student Evaluation of Faculty (SEF) Instrument having a 5-point Likert-type scale (i.e., Excellent, Very Good, Good, Fair, Poor) were analyzed using Rasch Measurement Theory through the rating scale model. The primary goal of the study was to characterize teachers based on the viewpoint of students. Secondly, it was to identify differences between the perception of physics students of their own instructors and that of students of other subjects.

The study involved 3849 students of various bachelor's degree programs at Benguet State University who rated a total of 17 instructors (composed of 5 Mathematics, 6 Physics, 3 Statistics, and 3 Information Technology teachers). The distribution of students was: 1271 for Mathematics subjects, 1265 for Physics subjects, 526 for Statistics sub-



jects, and 787 for Information Technology subjects. The rating was for the 1st semester of school year 2005-2006.

Results revealed that 17 of the 24 items were working coherently as indicators of classroom teaching performance. Apparently, the 7 other items were being interpreted by students in various ways. However, they deserved closer scrutiny because they identify where students and teachers might need to negotiate meanings. Four of these items involved time: the punctuality of teachers in coming to class, the regularity of their attendance, their prompt starting and dismissal of classes, and their prompt returning of corrected papers. The other three involved: relating subject matter to real life situation; making students feel free to inquire, express ideas, or disagree; and, (the teacher) coming to class in proper attire. Subsequent results (i.e., with the seven item misfits taken out) revealed the teachers were given the highest ratings (i.e., towards the “Excellent” side of the scale) on two items: “Shows mastery of subject matter” and “Projects good personality”. In contrast, they obtained the lowest rating on “Diagnoses learning problems of students”. Nevertheless, all of these ratings are still at the higher end (or toward the “Excellent” side) of the scale.

Furthermore, there were significant interactions between student ratings and subjects taught by instructors. For instance, Physics students perceived that their instructors had lesser mastery of subject matter, compared to Mathematics students. Quite the opposite, Physics students perceived that their instructors provided up-to-date information more frequently. Results are argued to be stable due to the acceptable values of reliability and separation for both item and persons that emerged from the modeling of data. Some implication of these results to the teaching of tertiary level Physics, as well as to the refinement of the instrument, are offered.

#### 30.04 **Secondary Students’ Physics Self-Efficacy: Gender Implication**

PPJ, Vol. 30 (2008), pp. 37-43

Julius M. Jose

San Aurelio National High School

San Aurelio, Balungao, Pangasinan 2442

[drj2\\_list@yahoo.com](mailto:drj2_list@yahoo.com)

##### **Abstract**

This study was conducted to verify the relationship between the students’ self-efficacy and their gender. The result of this research in-

dicates that there are gender-related differences in students' efficacy in performing laboratory exercises and experiments, taking Physics examination, making science projects, and solving Physics Problem.

30.05 **Applying Rubrics in Physics Laboratory Experiments\***

PPJ, Vol. 30 (2008), pp. 44-62

Roel D. Taroc, Ph.D.

Physics Department, Siquijor State College

Old Capital Circle, North Poblacion

6226 Larena, Siquijor

[wingroe@yahoo.com](mailto:wingroe@yahoo.com)

**Abstract**

This study aimed at investigating the utilization of scoring rubrics in evaluating students' achievement level in College Physics laboratory experiments at Siquijor State College as basis for adoption. The academic performance level of most respondents in laboratory experiments was Excellent. It implies then that students were serious in their work and exposed in conducting laboratory experiments. The scoring rubrics used to assess the achievement level of students in college physics laboratory experiments were an effective technique since it minimizes subjectivity in grading. The achievement level of the students in laboratory experiments. It means that students with high academic performance level would have high achievement level. It was also dependent on respondent's sex. It means that male students had high achievement level compared with female students. It revealed further that male students could perform laboratory experiments better than female students.

The scoring rubrics used in this study in assessing achievement level in college physics laboratory experiments should be adopted since they are powerful tools for both teaching and assessment. Physics teachers should utilize scoring rubrics in order to reduce the amount of time spent in evaluating student work since they can often simply circle an item in the rubric, rather than struggling to explain the flaw or strength they have noticed and figuring out what to suggest in terms of improvements.

30.06 **Architecture Students' Expectations in Physics and Teachers' Perceptions**

PPJ, Vol. 30 (2008), pp. 63-74

Bobby D. Manlapig and Darwin L. Saludez  
Physics Department, Mapua Institute of Technology  
Intramuros, Manila

**Abstract**

Students' expectation in physics as well as teachers' perceptions on what students should expect are very important factors in physics instruction. This paper drew the two groups' expectation and perception using the MPEX Survey. The instrument was given to twenty six architecture students and to five physics teachers in Mapua Institute of Technology. The results showed the big gap of the expectation of students from their teachers and the experts as well.

**30.07 Simple Experiments in Rotational Motion**

PPJ, Vol. 30 (2008), pp. 75-79

Vicenta C. Maxino  
Maxino College  
Dumaguete City

**30.08 Effects of Copper Content and Pelletizing Pressure on the XRD Patterns of Melt-Quenched  $\text{Bi}_{1.6}\text{Pb}_{0.4}\text{Sr}_2\text{Ca}_{n-1}\text{Cu}_n\text{O}_y$  Ceramics**

PPJ, Vol. 30 (2008), pp. 80-85

Michelle T. Natividad, Shirley T. Palisoc, Ph.D., Ma. Cecilia A. del Mundo  
De La Salle University  
Taft Avenue, Manila

**Abstract**

The effects of varying the copper content and pelletizing pressure on the x-ray diffraction (XRD) patterns of super conducting  $\text{Bi}_{1.6}\text{Pb}_{0.4}\text{Sr}_2\text{Ca}_{n-1}\text{Cu}_n\text{O}_y$  ceramics are examined. The samples were fabricated via the melt-quenched method. The copper content with  $n=3.5$  had the highest percentage of the high Tc peaks. The low Tc phase was predominant in all samples. There is no observable trend on the effects of varying the pelletizing pressure on both high Tc and low Tc phases of the samples.

**30.09 The Physics of Blood Flow and Blood Pressure**

PPJ, Vol. 30 (2008), pp. 86-90

Hope M. Bandal, Ph.D<sup>1</sup> and Vanessa M. Bandal<sup>2</sup>

<sup>1</sup> Physics Department, Siliman University

<sup>2</sup> U.P. College of Medicine, 2005

**30.10 Folk Toys in Teaching Fluid Mechanics: Apparatus and Learning Module**

PPJ, Vol. 30 (2008), pp. 91-100

Prof. Perla P. Montealegre

Technological University of the Philippines - Visayas

Talisay City, Negros Occidental

**30.11 PPS MARCH**

**30.12 Philippine Physics Society  
29<sup>th</sup> Annual National Physics Convention**

Fr. Saturnino Urios University

Balanghai Hotel and Convention Center

Butuan City, Caraga Region

April 11-14, 2007

388 Participants

**30.13 Physics Olympics Congress**

La Consolacion College HTM Building

Bacolod City

September 19, 2007

242 Participants

**30.14 Philippine Physics Society**

**2007 Luzon Physics Conference Updating and Upgrading Methodology and Content of Physics Teaching**

Oct.22-24, 2007

Colegio De San Juan De Letran – Calamba

Calamba City, Laguna 4027

223 Participants

**30.15 Philippine Physics Society**

**2008 Regional Physics Olympics Workshop**

Maxino College

Bagacay, Dumaguete City  
january 26, 2008  
134 Participants

## Philippine Physics Journal, Vol. 29 (2007)

### 29.01 **Bioeffects of Ultrasound For Therapy**

PPJ, Vol. 29 (2007), pp. 1-4

Loreto B. Feril, Jr., Katsuro Tachibana, Kazuki Yamaguchi, Koichi Ogawa, and Hitomi Endo

Department of Anatomy, Fukuoka University School of Medicine,  
Fukuoka, Japan

[ferilism@yahoo.com](mailto:ferilism@yahoo.com)

### 29.02 **Characterization of BSCCO Via SEM and Determination of Critical Temperature**

PPJ, Vol. 29 (2007), pp. 5-13

Bobby D. Manlapig and Darwin L. Saludez

Physics Department, Mapua Institute of Technology Intramuros, Manila

#### **Abstract**

We characterize a BSCCO high  $T_c$  superconductor using SEM and measure the voltage ( $V$ ) and Resistance ( $R$ ) as functions temperature. We find that, using SEM, the BSCCO sample manages to display surface characteristics unique to high- $T_c$  superconductors. Furthermore, by characterizing the elements of the superconductor according to activation energy, we find that the graph of the energy as a function of the number of elements present show that the dominant elements present in the sample are those which comprise BSCCO. Finally, by measuring the voltage and resistance as functions of temperature, we find that the behavior of the voltage (and consequently, the resistance) at constant current  $I$  conforms to the pattern expected for high- $T_c$  superconductors; that is, a sudden upsurge in the value of  $V$  and  $R$  at a given temperature, or  $T_c$ .

### 29.03 **A Physics Teacher in Development Work: A Sharing of Experience and Service Learning**

PPJ, Vol. 29 (2007), pp. 14-19

Joyrence Mervin Q. Agas

Head Office for the Social Orientation and Community Involvement  
Programs [SOCIP]  
Mapua Institute of Technology

### **Abstract**

The paper discusses a Physics teacher's experiences in responding to community needs through the application of Physics principles. It shows that a teacher in Physics neither confines nor interacts solely with the students. It explores the infinite possibilities of doing extracurricular outreach and community development.

Shown here are some of the community outreach projects implemented by the Mapua Institute of Technology through the Office for the Social Orientation and Community Involvement Program [SOCIP]. The Institute has defined its outreach activities as Extensions Service Programs. It aims to alleviate conditions of the community by responding to the community's needs through technical know-how in the fields of Physics and Engineering.

#### **29.04 Exploring the Relationship Between Epistemological Beliefs and Achievement in Physics of Engineering Students**

PPJ, Vol. 29 (2007), pp. 20-30

Darwin L. Saludez<sup>1</sup>, Bobby D. Manlapig<sup>1</sup>, Fe M. Novida<sup>1</sup>, May M. Lozada<sup>1</sup>, Recardo De Leon<sup>1</sup>, and Dr. Ching Ong<sup>2</sup>

<sup>1</sup> Physics Department

Mapua Institute of Technology

<sup>2</sup> Science Education Department

De La Salle University

### **Abstract**

This paper explores the relationship between the epistemological beliefs of college physics student and their level of academic achievement in college physics subjects. Their epistemological beliefs are determined using EBAPS (Epistemological Beliefs and Achievement of Physics Students), which is a forced-choiced instrument designed to determine student's epistemological beliefs along five learning dimensions. Their level of academic achievement, on the other hand, is determined by computing their quiz scores. Using the Spearsman's Rho correlation test, the researchers find that in general, there is a statistically significant correlation between the student's level of achievement and their epistemological beliefs in physics, not just in terms of the overall EBAPS score also along three of the five learning dimensions. This

means that in presenting a topic in a college physics class, one must take into consideration the student's epistemological beliefs in order to ensure that the students will have a high level academic achievement, which implies that the student has internalized the lesson effectively. The study also manages to establish a direct link between the epistemological beliefs and level of academic achievement in physics of college physics students. However, the study finds that there seems to be no statistically significant correlation between the student's achievement level in physics and their epistemological beliefs towards the real-life applicability of what they learn in their physics subjects. This finding is surprising in lieu of the fact that there is an overall correlation between the epistemological beliefs and level of academic achievement in physics of college physics students. This suggest a possible new avenue of research, one geared towards exploring the emergence of this result.

**29.05 Physics Portfolio Artifacts: Proofs of the Learners' Higher Order Thinking Skills**

PPJ, Vol. 29 (2007), pp. 31-39

Dr. Renan P. Limjuco

Ateneo de Davao University

C M Recto Avenue, Davao City

**29.06 Engineering Students' and Instructors' View in Physics Using Maryland Physics Expectations Survey (MPEX)**

PPJ, Vol. 29 (2007), pp. 40-49

Darwin L. Saludez and Bobby D. Manlapig

Physcs Department, Mapua Institute of Technology

Intramuros, Manila

**29.07 G-Force Apparatus**

PPJ, Vol. 29 (2007), pp. 50-54

Joel V. Lubrica, PhD

Benguet State University

[jlubrica@yahoo.com](mailto:jlubrica@yahoo.com)

**29.08 An Inventory of College Students' Conceptions Related to Heat and Thermodynamics**

PPJ, Vol. 29 (2007), pp. 55-70

Mario P. Obrero, PhD  
University of Northern Philippines  
Vigan City, Ilocos Sur

**Abstract**

This study was conducted to determine the correct and prevalent alternative conceptions related to heat and thermodynamics of college physics students. The instrument, entitled “A Concept Inventory for Heat and Thermodynamics,” was administered to a sample of second year Engineering students in two state universities in Region I, namely: University of Northern Philippines and Mariano Marcos State University.

Results reveal that college students hold several conceptions regarding heat and thermodynamics. It is suggested that the alternative conceptions be addressed during instruction to ensure a higher student achievement in physics.

The Concept Inventory is recommended for use for instructional and research purposes.

**29.09 Locally-Constructed Solar Water Heater Model: A Preliminary Study**

PPJ, Vol. 29 (2007), pp. 71-79

Roel D. Taroc, Mast-Physics<sup>1</sup>

Lyndon M. Duhaylungsod, Mast-Physics<sup>2</sup>

<sup>1</sup> Physics Department, Siquijor State College

Old Capitol Circle North Poblacion

6226 Larena Siquijor

[wingroe2001@yahoo.com](mailto:wingroe2001@yahoo.com)

<sup>2</sup> TESDA-LNAS, Tigbawan

6228 Lazi, Siquijor

**Abstract**

The main concern of this study focused on the construction of a home-made modified Botswana solar water heater model and likewise determined the workability of the modified model since this is the first of its kind of device in the Province of Siquijor specifically at Caguinhoan, Talayong, Lazi, Siquijor. This model was based on the study conducted at Muchudi, Botswana in 1980. However, it is very feasible to construct.

It was found that there was an increase in temperature when reading was taken at interval of one hour for three (3) days. The data revealed



that between 12 noon to 2:00 o'clock in the afternoon, the temperature readings were at their highest points. Moreover, the amount of heat absorbed or lost considerably changed from time to time from 7 o'clock in the morning until 5 o'clock in the afternoon.

It can be concluded that the locally-constructed solar water heater is functional and it is suggested that its performance test will be done as soon as possible so that this device can be introduced to the community for adoption.

29.10 **Electron Microscopy**

PPJ, Vol. 29 (2007), pp. 80-89

Koichi Ogawa, PhD

Department of Anatomy, Fukuoka University School of Medicine

7-45-1 Nanakuma, Jonan-ku, Fukuoka 814-0180 Japan

[Ogawa-ko@fukuoka-u.ac.jp](mailto:Ogawa-ko@fukuoka-u.ac.jp)

29.11 **Proton Cancer Therapy**

PPJ, Vol. 29 (2007), pp. 90-94

Shigekazu Fukuda, PhD

Proton Medical Research Division, R & D Department,

The Wakasa-wan Energy Research Center (WERC)

64-52-1, Nagatani, Tsuruga, Fukui, Japan 914-0192

[sfukuda@werc.or.jp](mailto:sfukuda@werc.or.jp)

**Abstract**

The aim of this article is to provide some introductory knowledge to readers who are familiar with the radiation therapy using X-rays, electrons neutrons, protons, and carbon ions. After tracing the history of the particle therapy including proton therapy, briefly, we concentrate on the principle of the proton therapy, that is, the delivery of a high dose of energy to the tumor while sparing normal tissue around it. Finally, the outline of the planned proton therapy facility of Fukui Prefecture in Japan is presented as an actual example.

29.12 **Two Non-Proprietary Softwares in Teaching Astronomy**

PPJ, Vol. 29 (2007), pp. 95-101

Anatoly Karpov Pajunar Buss, MA

Astro-Meteo Instructional Laboratory

Physics Department, Siliman University

6200 Dumaguete City, Oriental Negros, Philippines

[anatolykarpov\\_buss@yahoo.com](mailto:anatolykarpov_buss@yahoo.com)

### **Abstract**

Battling the high cost of educational equipment and books, non-proprietary softwares, like Celestia and Kstars, were created as alternative tools in teaching astronomy. They are used in navigating the non-proprietary graphical desktop planetarium and virtual space simulations. They are some of the popular and powerful demo engines for classroom use or general illustration of astronomical topics available for free. Kstars is the first presented, followed by Celestia.

#### **29.13 Thermal Conductivity of Common Insulating Materials**

PPJ, Vol. 29 (2007), pp. 102-108

Hope M. Bandal, PhD and David B. Ragudo

Physics Department, Silliman University

Dumaguete City

#### **29.14 Specific Heat of Some Construction Materials**

PPJ, Vol. 29 (2007), pp. 109-114

Hope M. Bandal, PhD and Franz Josef I. Crispo

Physics Department, Silliman University

Dumaguete City

#### **29.15 Some Physical Properties of Local Woods**

PPJ, Vol. 29 (2007), pp. 115-126

Vicenta C. Maxino, PhD

Physics Department, Silliman University

Dumaguete City 6200

#### **29.16 A Low-Cost Optical Reflection Apparatus**

PPJ, Vol. 29 (2007), pp. 127-139

Gerardo C. Maxino, PhD

Physics Education Center

Maxino College

6200 Dumaguete City

### **Abstract**

Two versions of an inexpensive optical reflection apparatus are presented. Results of test show high acceptability and reability of the apparatus.

29.17 PPS March

29.18 **28<sup>th</sup> NATIONAL PHYSICS CONVENTION SEMINAR-WORKSHOP**  
**19<sup>th</sup> NATIONAL PHYSICS OLYMPICS**  
**14<sup>th</sup> NATIONAL PHYSICS FAIR**

April 5-9, 2006

Aklan State University Banga, Aklan

412 Participants

217 Schools/Institutions

From Luzon, Visayas, Mindanao

## **Philippine Physics Journal, Vol. 28 (2006)**

28.01 **Light-Emitting Diode (LED) As Wireless Interface**

PPJ, Vol. 28 (2006), pp. 1-4

Engr. Bryanpete R. Tabada, Mast-Physics

Siquijor State College

Larena, Siquijor

### **Abstract**

Light-Emitting diode (LED) as wireless interface was shown possible, but limited to only a short range of detection about 60 mm. LED could become the cheapest wireless interface but the only disadvantage is its small induced power. A lot of voltage and current amplification that demands large power. In addition, LED cannot detect a light signal from infrared laser, thus, it is a short range interface.

28.02 **The Physics Teacher and the Bicycle**

PPJ, Vol. 28 (2006), pp. 5-10

CJC Santisteban

Physics Department

With RO Damian, School of EE-ECE-COE

Mapua Institute of Technology

[cjsantisteban@mapua.edu.ph](mailto:cjsantisteban@mapua.edu.ph), [rodamian@mapua.edu.ph](mailto:rodamian@mapua.edu.ph)

### **Abstract**

Inspired by the all-around increase in the number of cyclist on Manila streets and the wave of interest in racing that is sweeping today's youth, we decided to explore a realistic use of bicycles in the physics classroom. Following is a report on what a physics teacher can

do with bicycle, a few wires, a computer and few other things.

28.03 **The Physics of Positron Emission Tomography (PET) Imaging: Some Remarks**

PPJ, Vol. 28 (2006), pp. 11-15

Dr. Vicenta C. Maxino

Physics Department, Silliman University

6200 Dumaguete City, Philippines

28.04 **An Easy-to-Construct Loop-the-Loop Apparatus**

PPJ, Vol. 28 (2006), pp. 16-19

Joel V. Lubrica, PhD

Associate Professor V

Benguet State University

La Trinidad, Benguet

[jlubrica@yahoo.com](mailto:jlubrica@yahoo.com)

28.05 **Enhancing Learning of Resistors in Series and Parallel Using The Contextual Approach**

PPJ, Vol. 28 (2006), pp. 20-23

Santisteban, C.J.C, Tanawan, C.S.J.

Mapua Institute of Technology

Intramuros, Manila

[cjsantisteban@mapua.edu.ph](mailto:cjsantisteban@mapua.edu.ph), [crsanjuan@mapua.edu.ph](mailto:crsanjuan@mapua.edu.ph)

**Abstract**

One of the latest catchwords in educational circles is constructivism. Learners construct knowledge for themselves, based on what they already know, what they experience, what they believe in, what they fear, and what their prejudices are. In this study, the authors created two learning settings applying some constructivist principles and compared these with the traditional lecture and laboratory platform currently being used. One experimental setting or methodology was totally learner-centered where the students proceeded directly with the learning activity while the teacher acted solely as facilitator and made herself available to clarify questions posed by the students. In the other methodology, a brief lecture is delivered prior to the activity. Otherwise, the two experimental methodologies were almost the same. The results indicate that the students performed best under the contextual learning scheme with a brief lecture preceding the learning activity.

Note that in the first experimental setting, the line between lecture and laboratory was erased. In the second experimental setting, lecture is kept to a minimum, not even requiring separate hour. The authors believe that such findings should be reiterated by further data collection in other groups of students and using other topics. These and subsequently results have serious implications on how the separation of physics lecture and laboratory can continue to be practiced and justified.

**28.06 Strategy Mapping with Model Specification: Its Impact on Problem-Solving Skills of the Nursing Students in College Physics in San Juan Pedro College**

PPJ, Vol. 28 (2006), pp. 24-34

Renan P. Limjuco

San Pedro College

800 Davao City

**28.07 Upgrading Electronic Lab With Printed Circuit Board Lay Outing Softwares**

PPJ, Vol. 28 (2006), pp. 35-39

Julius M. Jose<sup>1</sup>

George M. Jose<sup>2</sup>

Galdys Venus M. Jose<sup>3</sup>

<sup>1</sup> San Aurelio National High School

San Aurelio 2442, Balungao, Pangasinan

[drj2\\_list@yahoo.com](mailto:drj2_list@yahoo.com)

<sup>2</sup> Producers Bank, Sta. Barbara, Pangasinan

<sup>3</sup> College of Education, University of the Philippines

Diliman, Quezon City

**Abstract**

The growing accessibility of interactive computer based interfacing laboratory modules allows faster data acquisition processes which may enhance the learning process. But even if there are many free and readily available schematics, blue prints plans and application programs that can be used to construct interactive computer based interfacing laboratory modules, the circuitry involved is still a problem. This paper examines some of the free printed circuit board lay-outing programs that will aid in trouble shooting circuitry and allow a teacher to spend more time on the activity.

28.08 **Measurements of Thermal Properties of Wood Conducted in Philippine School Laboratories**

PPJ, Vol. 28 (2006), pp. 40-46

Liza Marie Tanudra Dangkulos

Acoustics and Materials Research Laboratory

Physics Department, Silliman University

6200 Dumaguete City, Philippines

28.09 **What are the Conceptions of Math Major and Non-Math Major Teachers in Mathematics and How Do They Affect Their Practices in Teaching Math**

PPJ, Vol. 28 (2006), pp. 47-53

Bobby D. Manlapig and Darwin L. Saludez

Physics Department

Mapua Institute of Technology

**Abstract**

There are evidences that there is a relationship between conceptions of teachers about the subject they teach and their practices in teaching. This article shows the conceptions and practices of math and non-math major mathematics teachers in college. Six mathematics teachers, 2 math majors and 4 non-math majors, were purposively chosen to be interviewed and one of whose classes was chosen for observation. All of the respondents were master's degree holders. The result shows that math major teachers are more inclined to be student-centered teachers than non-math major teachers. The result shows how the two groups of math teachers differ on their perspective about meaningful learning. Implications of these results are discussed.

28.10 **The Determination By Pulse Height Analysis of The Rate of Penetration of Deposited Radioactive Material in Soil Under Laboratory Conditions**

PPJ, Vol. 28 (2006), pp. 54-66

Annaliza Z. Estrebello and Gerardo Maxino, PhD

Environmental Radioactivity Research Laboratory

Physics Department, Silliman University

6200 Dumaguete City

**Abstract**

The rates of penetration of Potash (K-40) in the 4 different types of

soil were experimentally determined using pulse height analysis under laboratory conditions. Potash was allowed to penetrate for 5, 10, 15, 20 days.

A penetration trend can be seen from the results although a numerical description of the rate of penetration of K-40 in soil was not fully accomplished in this study. The type of soil that permits the fastest penetration was not fully determined. However, it can be concluded that the penetration of K-40 is until the 10<sup>th</sup> cm.

**28.11 Ultrasound in Medicine: To Search and Destroy Diseased Tissues**

PPJ, Vol. 28 (2006), pp. 67-72

Loreto B. Feril, Jr., MD, PhD and Katsuro Tachibana, MD, PhD  
Department of Anatomy, Fukuoka University School of Medicine  
7-45-1 Nanakuma, Jonan-ku, Fukuoka 814-0180 Japan  
[feril@adm.fukuoka-u.ac.jp](mailto:feril@adm.fukuoka-u.ac.jp)

**28.12 The Resistance of an Ohmic Device: A Pedagogical Plan**

PPJ, Vol. 28 (2006), pp. 73-80

Sharon T. Toledo  
St. Paul College of Parañaque  
Parañaque City

**28.13 A Comparative Study on Two Teaching Strategies for Enhancing Students' Problem Solving Skills and Conceptual Understanding**

PPJ, Vol. 28 (2006), pp. 81-92

Ernesto S. Dedel, Jr  
College of Science, Palawan State University  
Puerto Princesa City

**Abstract**

This study focuses on the effect of Orientation, Planning, Action and Checking (OPAC) model of explicit problem solving strategy on student's problem solving skills and conceptual understanding in comparison with that of the traditional method. The study used the non-equivalent pretest and posttest control group design, a quasi-experimental design consisting of an experimental group and a control group, the subjects of which not being randomly assigned. The

subjects of this study were two sections of first year students taking up Bachelor of Science in Mechanical Engineering at Palawan State University. The students were enrolled in Physics 2/L a non calculus introductory physics course during the second semester of school year 2003-2004. Student's achievement was measured in terms of their performance scores in a teacher-made test consisting of 20 multiple choice and 5 word items. The results of this study revealed the following: (1) The OPAC model of explicit problem solving strategy used in physics instructions significantly enhanced students' achievement in terms of (a) problem solving skill, (b) conceptual understanding, and (c) problem solving skills and conceptual understanding; (2) Students' problem solving skills significantly correlated with conceptual understanding.

**28.14 Disembedding Ability, Working Memory Capacity and Problem Solving Approaches of Students**

PPJ, Vol. 28 (2006), pp. 93-98

Amanca Ragandac-Vallente, PhD

Mariano Marcos State University

Batac, Ilocos Norte

[amyvallente@yahoo.com](mailto:amyvallente@yahoo.com)

**Abstract**

This qualitative study describes the problem solving approaches used by students of different levels of working memory capacity and disembedding ability in solving two forms of problems in Mechanics. The result of the Digit Backward Test (DBT) and the Find-A-Shape-Puzzle (FASP) were used to identify the levels of working memory capacity and disembedding ability of the students respectively. Students solved four clarification and verification of students' written solutions, the students were individually interviewed after the problem solving session. Results showed that the students of the same as well as of different levels of working memory and disembedding ability used different logical approaches in solving a problem.

**28.15 Geometric Optics in Flash**

PPJ, Vol. 28 (2006), pp. 99-104

Sarkhan S. Baun

Mapua Institute of Technology

[sbaun@yahoo.com](mailto:sbaun@yahoo.com)

**Abstract**



While the Microsoft Power Point has long been the software of choice when designing and making presentations due to its availability and ease of use, Multimedia Flash offers a more powerful and flexible alternative. Designed by Macromedia to help provide web designers and programmers the ability to produce low-bandwidth animations and presentations on the Web, Flash can be used to deliver more than what PowerPoint can because of ActionScript, the scripting language that programmers use to tell Flash what to do. In this project, the proponent explored how flash can be used to present and demonstrate the concepts of geometric Optics. The lessons and examples were discussed in slide format just like in PowerPoint with the animation produced using the features of Flash itself as well as ActionScript without resorting to the use of animated clip-art; ActionScript was used to add interactivity to the movie, as well as to produce mini-programs that demonstrate reflection, refraction, and image formation using user-input.

28.16 **Reliability and Item Analysis on the Admission Test for the Master of Arts in Physics Program of the University of San Carlos: An Illustrative Case**

PPJ, Vol. 28 (2006), pp. 105-113

Rene B. Cabrera

University of San Carlos

Cebu City 6000

[renecabrera@yahoo.com](mailto:renecabrera@yahoo.com)

**Abstract**

This paper illustrates how an admission test may be evaluated. An item Analysis, mainly based on the methodology developed and used in Michigan State University Scoring Office was conducted using the test score results of the 25 student applicants who took the University of San Carlos Master of Arts in Physics (USC-MAP) Admission Test. This study sought to find out the Index of Difficulty and Index of Discrimination of the test items of the said examination. Split Half Reliability Test was employed. On the average the applicants got 54.2% correct answers or an average mean equal to 27.12 of the 50-item test. Based on the applicants' test scores, the average Index of Difficulty and Average Index of Discrimination of the test items were 45.5 and 37.9 respectively.

28.17 **Gamma Spectra of Some Fruits and Vegetables from Mabi-**

**nay, Oriental Negros**

PPJ, Vol. 28 (2006), pp. 114-124

Anatoly Karpov Pajunar Buss, Ailene Alaban Manso and Gerardo Chua Maxino PhD.

Environmental Radioactivity Research Laboratory  
Physics Department, Silliman University  
6200 Dumaguete City, Oriental Negros

**28.18 Using Ultrasound for Drug Delivery**

PPJ, Vol. 28 (2006), pp. 125-135

Katsuro Tachibana, MD, PhD and Loreto B. Feril, Jr., MD, PhD  
Department of Anatomy, Fukuoka University School of Medicine  
7-45-1 Nanakuma, Jonan Fukuoka 814-0180

[k-tachi@cis.fukuoka-u.ac.jp](mailto:k-tachi@cis.fukuoka-u.ac.jp)

**28.19 The Python Language: An Overview**

PPJ, Vol. 28 (2006), pp. 136-142

Rogel Arnel C. Lusares  
Silliman University  
6200 Dumaguete City

**28.20 Vicente Guzman Sinco: His Thoughts on Research, Science and Education**

PPJ, Vol. 28 (2006), pp. 143-148

Dr. Thelma M. Bueno  
Silliman University  
6200 Dumaguete City

**28.21 Measuring Planck's Constant  $h$  with Student-Made Apparatus**

PPJ, Vol. 28 (2006), pp. 149-152

Gerardo C. Maxino, Virginia D. Tubio Jr., Anilyn L. Acosta, Franz Josef I. Crispo, Blesilda V. Esterioso, and David B. Ragudo  
Silliman University  
6200 Dumaguete City

**28.22 2005 Philippine Physics Society Luzon Conference**

October 21-22, 2005

Technological University of the Philippines  
Ayala Blvd., Ermita, Manila 1000  
166 Participants  
104 Schools/ Institutions

**28.23 Philippine Physics Society  
27<sup>th</sup> Annual National Seminar/Workshop – Convention**

April 6-9, 2005  
University of Baguio  
Baguio City  
366 Participants  
227 Schools/ Institutions

**28.24 National Seminar-Workshop on Non-Proprietary Software**

January 27-28, 2006  
Physics Department, Silliman University  
Dumaguete City  
15 Participants

**28.25 Seminar on Open Source and Science Education**

February 18, 2006  
Physics Department, Silliman University  
Dumaguete City  
Lecturer: Dominique Gerald Cimafranca  
Member, Board of Directors  
Philippine Linux User's Group, Inc  
8 Participants

**28.26 Regional Seminar-Workshop in Physics**

July 29-30, 2005  
Aklan State University  
Banga, Aklan  
68 Participants

**28.27 PPS MARCH**

## Philippine Physics Journal, Vol. 27 (2005)

### 27.01 Magnetism and Faraday's Law

PPJ, Vol. 27 (2005), pp. 1-12

Francisco Glover, S.J.

Ateneo de Davao University

Davao City

### 27.02 New Instruments for a Student Laboratory in Intermediate Electronics

PPJ, Vol. 27 (2005), pp. 13-26

Engr. Rafael U. Gaid, E.C.E. Francisco Glover, PhD & Engr. Reymann M. Zamora, E.C.E.

Ateneo de Davao University

Davao City

### 27.03 T-Test Analysis of the Effect of Mental Fatigue on the Reaction Time to Sound and Light Using DataStudio

PPJ, Vol. 27 (2005), pp. 27-35

Kimberly Anne Lim and Gil Nonato C. Santos

Physics Department

De La Salle University

Taft Avenue, Manila

[limki@yahoo.com](mailto:limki@yahoo.com), [santosg@dlsu.edu.ph](mailto:santosg@dlsu.edu.ph)

#### Abstract

Computer based tests were conducted to determine the effect of mental fatigue on the reaction time to sound and light using DataStudio. A random sample of 30 volunteer subjects was tested on two different occasions: after an exam and during their free time. These corresponded to their mentally fatigued and nonmentally fatigued states. Results from the experiment show that, comparing between the two stimuli, sound and light, the overall mean reaction time to sound is significantly faster than the reaction time to light. Results from the experiments also show that the average reaction time to sound is not significantly slower when mentally fatigued than when not mentally fatigued. The same is the case for light the average reaction time to light is not significantly slower when mentally fatigued.

27.04 **The Effect of Human Motion Graph Activity on Students' Motion Graph Interpretation Skills**

PPJ, Vol. 27 (2005), pp. 36-46

Charish R. San Juan

Mapua Institute of Technology

Intramuros, Manila

[crsanjuan@mapua.edu.ph](mailto:crsanjuan@mapua.edu.ph)

**Abstract**

The effect of the human motion graph activity on students' graph interpretation skills in kinematics was investigated. Forty students enrolled in College Physics 1 (Laboratory) at the Mapua Institute of Technology participated in this study. The results in the pretest showed that the students' ability to interpret motion graphs were low. The human motion graph activity helped the students to overcome some of their difficulties; however, since the students were exposed only to one MBL activity, there were still pertinent difficulties that remained.

27.05 **Improvements on the PC Interfaced Acceleration Measuring Device for Physics Laboratory Experiments**

PPJ, Vol. 27 (2005), pp. 47-51

Srilan Maranan<sup>1</sup>, Kristine Villamor<sup>1</sup>, Carlito S. Ponseca Jr.<sup>1</sup> and Anthony R. Cabrera<sup>2</sup>

<sup>1</sup> School of EE-ECE-CoE, Mapua Institute of Technology

Intramuros, Manila

<sup>2</sup> [anthony\\_rc@hotmail.com](mailto:anthony_rc@hotmail.com)

**Abstract**

Automated data acquisition circuits have been described using the parallel port of a computer through Visual C++. This is part of a continuous effort to produce low cost laboratory apparatus that are both accurate and easy to use. Two versions of an accelerometer device are described in this paper. Each prototype determined sources of errors (initial moment of inertia, device delay, code optimization) that were used in improving the design for the next version. For the first revision, errors of 13.63% and 16.38% between the experimental and theoretical values were recorded while the second revision showed errors of 12.58% and 7.20% on two different angles. The next revision of the prototype will include the use of embedded assembly code in the Visual C++ code together with advanced thread synchronization techniques to improve the accuracy of the measured data.

27.06 **Implementation of a Microcontroller Circuit Board for General Engineering Physics Laboratory Experiments**

PPJ, Vol. 27 (2005), pp. 52-56

Ednel Crisostomo, Oliver Viloan, Fatima Donayre, Resty O. Damian and Carlito S. Ponseca Jr.

Mapua Institute of Technology

Intramuros, Manila

**Abstract**

We have previously demonstrated several automated data acquisition circuits that have utilized microcontroller to process the acquired physical parameters and display it with a read out circuit. Among these are: a temperature sensing device, an acceleration measurement device, a circuit that measures the period of oscillation of simple pendulum and spring and a circuit that measures a time of flight of a body in a trajectory path. Through these devices, we were able to show that classroom experiments were not as expensive as compared to commercially available apparatus. However, each circuit was implemented separately. In this paper, we present a circuit where the enumerated laboratory experiments can be performed using a single circuit board. Results showed a small percentage error of the gathered data when compared to its theoretical value.

27.07 **UV Fluorescence Imaging of Vinblastine-4'-Anthranilate Distribution on Root Samples of Two Variants (Red Flower and White Flower) of *Catharanthus Roseus* (*C. Roseus*)**

PPJ, Vol. 27 (2005), pp. 57-61

Jonathan D. Galingan, Franz Josef S. Benjamin and Romeric F. Pobre  
Medical Physics Instrumentation Laboratory

Physics Department, De La Salle University-Manila

**Abstract**

Images of the vinblastine-4'-anthranilate distribution on root samples of two variants (red flower and white flower) of *C. roseus* or Tsit-sirika were obtained using an epi-fluorescence microscope (Olympus BX-51). Vinblastine-4'-anthranilate is a fluorescent under UV radiation with excitation and emission wavelengths of 330 nm and 441 nm, respectively. Twenty-five (25) different root samples for each variant were prepared which were laterally sectioned for larger image area. The root samples were placed on glass slide and imaged on the stage of the epi-fluorescence microscope. Images recorded by a sensitive CCD camera (Olympus DP-12) mounted on the trinocular port were processed

in a desktop PC using Adobe Photoshop ver. 7.0 application program to calculate the histogram of the fluorescence image of vinblastine-4'-anthranilate. Keeping the optical settings of the microscope constant, t-test analysis of the mean luminosity showed that the active fluorescent chemical (vinblastine-4'-anthranilate) was more apparent on the red variety than on the white variety of *C.roseus*.

27.08 **The Effect of Light and Temperature on Ecological Balance Between an Elodea Nattallii and Carassius Auratus in a Closed Environment Using Data Studio**

PPJ, Vol. 27 (2005), pp. 62-68

Crisman R. Yokingco and Gil Nonato C. Santos

De La Salle University Physics Department

[santosg@dlsu.edu.ph](mailto:santosg@dlsu.edu.ph)

**Abstract**

Ecological balance is the interactions of different organisms along with the environment, which is in a state of equilibrium. Small closed systems are efficient models in determining certain ecological factors for simulation. Closed systems were constructed using a beaker and stirrer to observe the presence of the balance and perform real time measurements on an aquatic system. The study presented a real time computer based experiment on the effect of light and temperature on the ecological balance between and Elodea Nattallii (aquatic plant) and a Carassius Auratus (goldfish) fish specimen. Thirty samples were conducted based on the following parameters, fish-to-fish with no light exposure and fish to plant with exposure to light. Results revealed on the fish-to-fish interaction with no light exposure exhibited a decrease in the pH values that can be attributed on the increase of carbon brought about by the interaction. However, results on the fish to plant interaction showed a minimal variation in the pH values which simply means that the interactions between light, fish, and plant were ecologically balanced.

27.09 **Physics Project Integration Visualization Tool (PIVit)**

PPJ, Vol. 27 (2005), pp. 69-73

Julius M. Jose

San Aurelio National High School

Balungao, Pangasinan

[drj2\\_list@yahoo.com](mailto:drj2_list@yahoo.com)

### **Abstract**

Designing projects and conducting research is a tedious job. However, tools like the Project Integration Visualization Tool (PIVit) software provide an environment that aids teachers as well as students to process their projects, activities, investigations, artifacts, and curricular objectives. This paper presents how PIVit can assist teachers and students in developing their projects as well as in sharing their ideas, projects, and planning with colleagues.

#### 27.10 **The Patterns Sketched from the Simultaneous Oscillations Occurring Along the X and Y Axes (The Computer Simulation Method of Determining Lissajous Figures)**

PPJ, Vol. 27 (2005), pp. 74-77

Armien John Samson

Physics Department, Mindanao State University-Main Campus

Marawi City, Lanao del Sur

### **Abstract**

A detailed analysis on the patterns sketched by taking into account simultaneous oscillations along x and y axes is being presented in this paper. A better understanding of this important phenomenon called Lissajous Patterns is best described by varying its controlling perimeter values and through the aid of numerical analysis. Two sets of graphical presentation have been done here. One is of the Cartesian coordinate system and the other polar.

#### 27.11 **Sample Micrographs of Grown Indium Nitride (InN) by Metal Organic Chemical Vapor Deposition (MOCVD)**

PPJ, Vol. 27 (2005), pp. 78-83

Carlito S. Ponseca, Jr.

School of EE-ECE-CoE

Mapua Institute of Technology

Intramuros, Manila

### **Abstract**

In this paper, the author presents sample micrographs of grown InN by metal organic chemical vapor deposition (MOCVD). The InN thin film was deposited on top of aluminum nitride (AlN) / sapphire ( $\alpha$ -Al<sub>2</sub>O<sub>3</sub>) system at a controlled temperature, pressure, and mass flow rate. Scanning electron microscope (SEM) micrographs revealed formation of hexagonal islands throughout the sample which has the same



structure as the theoretical structure of InN. When the cross section of the samples was investigated, crystallites were seen to be randomly distributed while its orientation has no specific pattern. It is believed that the rate of flow of the trimethylindium (TMI) influences this structural formation.

**27.12 A Simple Experiment for Measuring Minority Carrier Lifetime**

PPJ, Vol. 27 (2005), pp. 84-87

G. N. Santos<sup>1</sup> and R. V. Quiroga<sup>2</sup>

<sup>1</sup> [santosg@dlsu.edu.ph](mailto:santosg@dlsu.edu.ph)

<sup>2</sup> [quirogar@dlsu.edu.ph](mailto:quirogar@dlsu.edu.ph)

Solid State Physics Laboratory, Physics Department  
College of Science, De La Salle University  
2401 Taft Ave., Manila 1004

**Abstract**

The minority carrier lifetime of a sample germanium was measured by observing the decay of its conductivity after an initial photoexcitation. The measurements were done under different applied voltages across the sample. The characteristic exponential decay curve was observed in all cases. The time constant of the exponential curves represent the minority carrier lifetime of the sample. Results obtained were in the range 0.47–.57 ms, depending on the applied voltage.

**27.13 Inexpensive Photodetector Using Light-Emitting Diode (LED)**

PPJ, Vol. 27 (2005), pp. 88-92

Engr. Bryanpete R. Tabada

Siquijor State College

Larena, Siquijor

**Abstract**

This study aimed at putting up an inexpensive photodetector by the use of a light-emitting diode (LED). It investigates further which among the three LED detectors could induce voltage best.

In terms of the distance between the light source and the induced voltage, the data revealed their inverse relationship. The farther the receiver, the smaller the induced voltage; and the nearer the receiver, the larger the voltage induced. This proves Einstein's theory of photoelectric effect that the more photons received, the greater the electrons per second will be knocking out of the surface.

It is recommended that the use of light-emitting diode, particularly the green Transparent LED for use as a receiving element or detector in a communicator circuit.

**27.14 Effects of the Partial Substitution of Tin (Sn) into the Strontium (Sr) Site of the High-Tc BSCCO System**

PPJ, Vol. 27 (2005), pp. 83-96

<sup>1</sup> Amancia Ragandac-Vallente, Ph.D.

<sup>2</sup> Alex V. Quema

<sup>1</sup> Mariano Marcos State University

Batac, Ilocos Norte

[amyvallente@yahoo.com](mailto:amyvallente@yahoo.com)

<sup>2</sup> Laser Research Center for Molecular Science

Institute for Molecular Science, Japan

De La Salle University-Main

2401 Taft Ave., Manila

[alexq@ims.ac.jp](mailto:alexq@ims.ac.jp)

**Abstract**

The effects of the partial substitution of Tin (Sn) into Strontium (Sr) site of the high-Tc and Low -Tc BSCCO system is studied. X-ray diffraction analysis revealed the co-existence of the high- Tc and low- Tc phases in the most of the samples. Electrical resistivity measurements showed zero resistivity at 115 K for the sample prepared via solid-state reaction method and with nominal composition of  $\text{Bi}_2(\text{Sr}_{1.7}\text{Sn}_{0.3})\text{Ca}_2\text{Cu}_3\text{O}_{16}$ . Susceptibility measurement of this sample showed a transition onset of about 112 K. SEM analysis of this sample revealed that bar shaped crystals were formed.

**27.15 Application of Program Evaluation and Review Technique/ Critical Path Method to the Management of Physics Projects**

PPJ, Vol. 27 (2005), pp. 97-103

Dr. Thelma M. Bueno

Silliman University

Dumaguete City 6200

**27.16 Development and Validation of an Interactive Mechanics Visualization Software for Vector Addition, Subtraction, and Multiplication Using Python**

PPJ, Vol. 27 (2005), pp. 104-111

Joyrence Mervin Q. Agas<sup>1</sup>

Joel C. Alcaez<sup>2</sup>

<sup>1</sup> Physics Department

Mapua Institute of Technology

Intramuros, Manila

<sup>2</sup> DOIT

Mapua Institute of Technology

Intramuros, Manila

### **Abstract**

Interactive visualization software in vector addition, subtraction and multiplication was developed and validated. The language used is that of python which is a free downloadable program from the internet. The interactive software was validated by both experts and students at  $\alpha=0.05$  using two tailed t-test. The interactive software was also tested on the student's performance. Students who were exposed to the interactive software obtained higher test scores than those students who used chalk and board method only. This was validated by a two tailed t-test at  $\alpha =0.05$ . It shows that there is a significant difference between the performance of students using the interactive software and those who were not using the interactive software.

### 27.17 **Students' Problem Solving Performance, Working Memory Capacity, and Disembedding Ability**

PPJ, Vol. 27 (2005), pp. 112-117

Amanca Ragandac-Vallente, Ph.D.

Mariano Marcos State University

Batac. Ilocos Norte

[amyvallente@yahoo.com](mailto:amyvallente@yahoo.com)

### **Abstract**

This qualitative study determines the performance of students of different levels of working memory and disembedding ability in solving two forms of problems in Mechanics particularly in dynamics. The working memory capacity and disembedding ability of the students were determined. Results showed that the extremes of performance in both forms of problems occurred between field independent student with high working memory capacity and field dependent student with low working memory capacity. Students of low working memory capacity but of high disembedding ability obtained higher scores in the two forms of the problem than the students of high working memory capacity but of low disembedding ability. Thus, working memory ca-

capacity and disembedding ability are significant factors in influencing performance of students.

**27.18 Achievement of Environmental Education-Related Competencies in Science: A Rasch Analysis**

PPJ, Vol. 27 (2005), pp. 118-132

Joel V. Lubrica Ph.D

Dean College of Arts and Sciences

Benguet State University

La Trinidad, Benguet

**Abstract**

This study dealt with views of teachers on the integration of environmental education with secondary school science. In particular, the achievement of environmental education related competencies in secondary school science was considered. The investigation involved 73 teachers who responded to questionnaires. All of the respondents were from Benguet Division of Department of Education in Northern Luzon. Questionnaire data were analyzed using Rasch analysis. Qualitative data were subjected to content analysis.

Results indicated that teachers perceived that the level of achievement by students of environmental education-related competencies through science classes was high. Moreover, an application-related competency was perceived to be more difficult to achieve than explanation or demonstration-related ones. Implications of results to the school implementation of environmental education and to the enhancement of the relevance of school science are presented. A future research initiative is identified.

**27.19 Improvised Cardboard Ramps: Experiments in Kinematics, Projectile Motion, and Momentum**

PPJ, Vol. 27 (2005), pp. 133-146

Sarkhan S. Baun

Physics Department

Mapua Institute of Technology

Muralla St. Intramuros, Manila

**27.20 Misconceptions in Mechanics Focusing on Force and Motion**

PPJ, Vol. 27 (2005), pp. 147-163

Roel D. Taroc, Mast-Physics

Physics Department, Siquijor State College  
Old Capitol Circle, North Poblacion  
6226 Larena, Siquijor  
[wingroe@netscape.net](mailto:wingroe@netscape.net)

**Abstract**

The great majority of tertiary students at Siquijor State College do not understand and apply the Newtonian Point of View. Instead Newton's Laws of Motion became the Students Law of Force and Motion. The students are prone to misinterpreting almost everything they see and hear in physics class.

27.21 **Development of a Facility for Growing Thin Films by Pulsed Laser Deposition Technique**

PPJ, Vol. 27 (2005), pp. 164-171

Elerie Jay L. Flores, Gil Nonato C. Santos and Reuben Quiroga, Ph.D  
De La Salle University Physics Department

Taft Ave. Manila

[floresej@yahoo.com](mailto:floresej@yahoo.com), [santos@dlsu.edu.ph](mailto:santos@dlsu.edu.ph), [quirogar@dlsu.edu.ph](mailto:quirogar@dlsu.edu.ph)

**Abstract**

A facility was developed to grow thin films using Pulsed Nd-YAG laser. A glass diffusion pump was utilized and connected to a glass bell jar at low vacuum pressure.  $\text{MgB}_2$  powder sample was pelletized and placed in a target holder inside the glass bell jar oriented at 42 degrees with respect to the target holder. A silicon film was used as a substrate that was attached to a glass slide with a distance of 2.0 and 3.5 cm with respect to the target. A laser power of 5.20 to 5.30 watts was utilized to ablate the  $\text{MgB}_2$  sample with 1064 nm wavelength at a pulse rate of 20 Hz. The deposition rate was varied at a low vacuum pressure. Results from the SEM showed that the presence of grains in the silicon substrate that are similar compared to literature. The study also focused on the importance of height when depositing the  $\text{MgB}_2$  target. As the deposition height increases, the grain size also increases. Deposition height is also an important factor in film adhesion of the  $\text{MgB}_2$  sample. The energy spectrum of the  $\text{MgB}_2$  thin film exhibited the presence of magnesium while that of boron is minimal since the latter is a light material. The presence of other peaks could be attributed to the silicon substrate and oxygen since the thin film has an MgO trace element, observed in the SEM as white particles. From the XRD, as the deposition time increases, the XRD peak intensity also increases. Moreover, as the deposition height decreases, The XRD

peak intensity increases.

**27.22 Literacy and Development: A Look at Some Hard Data**

PPJ, Vol. 27 (2005), pp. 172-183

Dr. Thelma M. Bueno

Silliman University

Dumaguete City 6200

**27.23 Determination of Mechanical Equivalent of Heat (J) Using Scrap Materials**

PPJ, Vol. 27 (2005), pp. 184-192

Noli P. Laylo

Mapua Institute of Technology

Intramuros, Manila

**Abstract**

The main concern of this study is the determination of the mechanical equivalent of heat (J) using an improvised apparatus made from PVC tube and scrap metal (aluminum and lead) shots. The study also focuses on the appeal or presentation, ease in handling and accuracy/reliability of the apparatus as a good substitute for an expensive commercially manufactured one.

By performing a number of trials using the two metals (300g of aluminum and 300g of lead ) in the two PVC tubes of effective lengths 80 cm and 90 cm respectively, the following observations were made. The longer PVC tube acquired the best results as compared to the shorter one due to the higher amount of potential energy that served as the amount of work done by falling metal shots. The 300g lead metal slots provided the reasonable results for the reason that it is of lower specific heat ( $c=0.031\text{ca/g.C}^\circ$ ), which allowed the metal to acquire the considerable change in its temperature.

In as much as the materials needed are produced locally, the improvised apparatus can easily be produced at a relatively lower cost. This apparatus could even be used for demonstration in lecture classes.

**27.24 Coefficients of Thermal Conductivity of Some Philippine Woods**

PPJ, Vol. 27 (2005), pp. 193-199

Gerardo Maxino and Liza Marie T. Dangkulos

Acoustics and Materials Research Laboratory

Physics Department, Silliman University

6200 Dumaguete City

**Abstract**

The coefficients of thermal conductivity of 12 different kinds of Philippine woods were experimentally determined, both for heat flowing parallel to the grain and for heat flowing perpendicular to the grain.

For the heat flowing across the grain, the values of the coefficients of thermal conductivity  $k$  ranges from  $1.37 \times 10^{-4}$  cal/(cm.s.C°) for Caimito to  $2.47 \times 10^{-4}$  cal/(cm.s.C°) for Gimelina.

For heat flowing along the grain, the values of the coefficient of thermal conductivity  $k$  ranges from  $2.44 \times 10^{-4}$  cal/(cm.s.C°) for Nangka to  $5.10 \times 10^{-4}$  cal/(cm.s.C°) for Mango.

Within each set of trials, the deviations of individual values from the average value are small.

An examination with available literature indicates that the values obtained are, at least, fairly accurate.

**27.25 Estimating the Power of the Sun**

PPJ, Vol. 27 (2005), pp. 200-201

Dick Hoekzema en Ed van den Berg

Center for Science Education

Universiteit of Utrecht

Utrecht, Netherlands

**27.26 Measuring the Light Absorption Coefficient of Some Locally Available Leaves**

PPJ, Vol. 27 (2005), pp. 202-210

Vicenta C. Maxino and Ryan S. Locsin

Acoustics and Materials Research Laboratory

Silliman University

Dumaguete City

**27.27 Specific Heat of Sand in Negros Oriental and Zamboanga Del Norte**

PPJ, Vol. 27 (2005), pp. 202-210

Hope M. Bandal, Ph.D. and Rhodora I. Villagrancia

Physics Department, Silliman University

Dumaguete City

27.28 **Graph and Drafting of a Source and a Sink Approaching One Another Producing the Pattern of a Doublet Using Numerical Analysis (A Computer Simulation Showing the Pattern of a Doublet)**

PPJ, Vol. 27 (2005), pp. 211-214

Hamdi Muhyuddin D. Barra

Physics Department

College of Natural Sciences and Mathematics

Mindanao State University

Marawi City, Lanao del Sur

**Abstract**

This study is focused on the formation of the pattern of a doublet functions i.e the stream function and velocity potential function, and the doublet velocity is made using the Runge-Kutta method. The relationships between the stream and velocity and theta are drafted in polar and Cartesian Coordinates.

27.29 **26<sup>th</sup> National Physics Convention and Seminar Workshop**

**17<sup>th</sup> National Physics Olympics**

**12<sup>th</sup> National Physics Fair**

April 1-4, 2004

Ateneo De Davao University

Davao City 8000

448 Participants

212 Schools/Institutions

From Luzon Visayas Mindanao

27.30 **Regional Seminar-Workshop on the Teaching of the Special Theory of Relativity, Photoelectric Effect and Brownian Motion: A Remembrance of Albert Einstein's Wondrous Outburst of Creativity (1905-2005)**

January 13, 2005

Silliman University

Dumaguete City

20 Participants



## Philippine Physics Journal, Vol. 26 (2004)

### 26.01 **Fabrication and Testing of Meh-PPV Thin Semiconducting Film as Potential Substrate for Optical Waveguide**

PPJ, Vol. 26 (2004), pp. 1-6

Carlito Ponseca, Jr.<sup>a</sup> Felicito S. Caluyo, Ph.D<sup>b</sup>, Ivan B. Culaba<sup>c</sup>

<sup>a</sup> ECE Department, School of EE-ECE-CoE

Mapua Institute of Technology

<sup>b</sup> ECE Department, College of Engineering

De La Salle University

<sup>c</sup> Department of Physics, School of Science and Engineering

Ateneo De Manila University

#### **Abstract**

In this paper, which extends a previous study [10] by attenuation measurements, we report the preliminary results on the fabrication and testing of poly[2-methoxy-5-(2'ethylhexyloxy)-1,4] phenylenevinylene (MEH-PPV) thin semiconducting film as possible substrate material for optical waveguide. The polymer was deposited onto low index of refraction ( $n=1.34$ ) magnesium fluoride ( $MgF_2$ ) coated on a base made of glass ( $SiO_2$ ). A relatively uniform film of MEH-PPV on  $MgF_2/SiO_2$  was obtained by spin-coating the polymer solution. The MEH-PPV/ $MgF_2/SiO_2$  layers show spectra with high transmittance in the region between 300-800 nm. The absorbance spectrum of MEH-PPV show marked peak at low value of wavelengths, which agrees with the literature. A dual laser source (Fabry-Perot LD) was used to measure the attenuation of the waveguide using an optical power meter. Results have shown that the mean attenuation of the polymer is 2.142 dB at 1310 nm and 0.439 dB at 1550 nm.

### 26.02 **The Metacognitive Behaviors of High-Performing and Low-Performing Engineering Students in Solving Physics Problems**

PPJ, Vol. 26 (2004), pp. 6-13

J. M. Alcala<sup>a</sup>, L. M. Baluyot<sup>a</sup>, N. S. D. Virtusio<sup>b</sup>

<sup>a</sup> Physics Department

Mapua Institute of Technology

[jmalcala2000@yaoo.com](mailto:jmalcala2000@yaoo.com), [baluyot\\_leo@yahoo.com](mailto:baluyot_leo@yahoo.com)

<sup>b</sup> Mapua IT Center

Makati

[ninosdv@yahoo.com](mailto:ninosdv@yahoo.com)

#### **Abstract**

Physics requires higher thinking skills and strategies in order for students to understand its concepts and solve challenge problems. One way to develop these skills and strategies necessary for learning physics is to activate student's metacognition. This study examined metacognitive strategies and behaviors that contributed to problem solving success or failure of engineering students. A Physics Metacognitive Problem Solving Assessment Sheet and a Systematic Metacognitive Worksheet were used to evaluate the different metacognitive strategies employed by the students. The result of this particular research indicated the need for metacognitive behaviors to become successful in Physics problem solving.

**20.03 A PC-Based Stress-Strain Apparatus for Classroom Demonstration**

PPJ, Vol. 26 (2004), pp. 14-18

J. Canales, E. Flores, and G. N. C. Santos

Physics Department, De La Salle University

Taft Avenue, Manila

**Abstract**

A computer interface stress-strain apparatus was used to generate the stress-strain curves of different materials. The set-up stretches a test coupon while it measures and displays on the computer screen the amount of force and stretch experienced in real time.

**26.04 Automation of Data Acquisition for Selected Physics Laboratory Experiments by PC Interface Using Parallel Port**

PJ, Vol. 26 (2004), pp. 19-22

Lester Vil Q. Artificio<sup>a</sup>, Carlito S. Ponseca, Jr<sup>a</sup>., Joyrence Mervin Q. Agas<sup>a</sup> and Anthony R Cabrera<sup>b</sup>

<sup>a</sup> School of EE-ECE-CoE, Physics Department

Mapua Institute of Technology

<sup>b</sup> Microelectronics Division

Advanced Science and Technology Institute

**Abstract**

In this paper, we describe the initial implementations of hardware interfacing through Visual C++. The designed circuits are mainly composed of sensors, amplifiers and analog to digital converters (ADCs) to produce the needed digital signal. They are read through the parallel port and converted to a human-readable format through graphical

user interface (GUI). Two experiments are described: a temperature sensing device that monitors the temperature and acceleration measurement device that calculates acceleration of an object by getting the time elapsed between four points. An average error of  $\pm 1^\circ\text{C}$  on the reading of the temperature monitor was recorded throughout the experiment. Also, the accelerometer's Light Dependent Resistor (LDR) is suspected to have introduced the delay in the system.

**26.05 Construction of an Improvised Apparatus for Determination of Permittivity of Free Space**

PPJ, Vol. 26 (2004), pp. 23-25

Julia G. Cuan

Department of Physics

Mapua Institute of Technology

Intramuros, Manila

**Abstract**

The study aims to develop and construct an improvised apparatus used to measure the permittivity of free space  $\epsilon_0$ , which is a fundamental constant in the field of electrostatics. Apparently, the results of the experiments performed showed that the constant  $\epsilon_0$  obtained using the improvised apparatus had a low percentage error.

**26.06 Electronic Temperature Monitoring Circuit as Substitutes to Conventional Thermometers**

PPJ, Vol. 26 (2004), pp. 26-30

Joyrence Mervin Q. Agas<sup>a</sup>, Lester Vil. Arificio<sup>b</sup>, Marco Ruel P. Manzanilla<sup>b</sup>, Michael C. Pacis<sup>b</sup> and Carlito S. Ponseca, Jr<sup>b</sup>.

<sup>a</sup> Physics Department

Mapua Institute of Technology

Intramuros, Manila

<sup>b</sup> Electronics and Communication Engineering Department, School of EE-ECE-CoE

Mapua Institute of Technology

**Abstract**

This project designs and tests an electronic circuit that will be used to substitute conventional thermometers. Testing of the designed circuit involves comparison of data read from the thermocouple and that displayed by the circuit. Data have shown that the thermocouple is more sensitive to change in temperature than the designed circuit.

Statistical analysis revealed that there is a strong correlation between readings of the circuit and the thermocouple.

**26.07 Determination of the Coefficient of Linear Expansion of Selected Philippine Woods Measured Across the Grain**

PPJ, Vol. 26 (2004), pp. 31-33

Darwin L. Saludez<sup>a</sup>, Bobby D. Manlapig<sup>b</sup> and Carlito S. Ponseca, Jr.<sup>a</sup>.

<sup>a</sup> Physics Department

Mapua Institute of Technology

<sup>b</sup> Electronics and Communication Engineering Department; School of EE-ECE-CoE

Mapua Institute of Technology

**Abstract**

This study determined the coefficient of linear expansion of three selected Philippine hardwood; namely, Tanguile, Mulawin, and Narra, measured across the grain. Statistical analysis of the gathered data, tested at 0.05 level of significance, showed that Mulawin's coefficient of linear expansion is between  $2.8218 \times 10^{-5} /C^{\circ}$  and  $4.1742 \times 10^{-5} / C^{\circ}$  while Narra's coefficient of linear expansion is between  $2.8108 \times 10^{-5} /C^{\circ}$  and  $5.3924 \times 10^{-5} /C^{\circ}$ . On the other hand, the computed coefficient of linear expansion for Tanguile is inconclusive since its standard deviation is too variable.

**26.08 Proficiency of Physics Teachers in Scientific Calculations: A Study Report**

PPJ, Vol. 26 (2004), pp. 34-41

Roel D. Taroc, Mast-Physics

Siquijor State College

6226 Larena ,Siquijor

[wingroe@netscape.net](mailto:wingroe@netscape.net)

**Abstract**

This study is designed to determine the proficiency level as well as the significant improvement from the pre-test to the post-test of the Physics teachers in scientific calculations as bases for curricular offerings.

The data revealed that the proficiency level of the Physics teachers in scientific calculations in the pre-test was poor and average in the post-test. It further showed that there was a significant improvement from the pre-test to the post-test scores of the Physics teachers after

an intervention was introduced.

26.09 **Orchestrating Physics Classes with Anvil Studio<sup>TM</sup>**

PPJ, Vol. 26 (2004), pp. 41-46

Julius M. Jose

San Aurelio National High School

San Aurelio 2442, Balungao, Pangasinan

[drj2\\_list@yahoo.com](mailto:drj2_list@yahoo.com)

**Abstract**

Sound is too abstract for students unless they can appreciate it. One way of simulating students to learn about sound waves is by allowing them to explore this phenomenon through playing a musical instrument. However, only a few know how to play at least one instrument. But with Anvil Studio they can be composers; they can play band or an orchestra or be sound engineers at the same time. Surprisingly with zero price tag, Anvil Studio is an outstanding tool with regards to sound manipulation.

26.10 **Measuring Sound Transmission Intensities of Some Local Materials**

PPJ, Vol. 26 (2004), pp. 47-60

Vicenta C. Maxino and Michelle Nena G. Nuñez

Acoustics and Material Properties Research Laboratory

Silliman University

Dumaguete City

26.11 **A Low-Cost, Versatile Linear Airtrack**

PPJ, Vol. 26 (2004), pp. 61-66

Francisco G. Glover, S.J., Ph.D

Ateneo de Davao University

Davao City

26.12 **Improving Problem Solving Skills in Physics using Model Specification in Strategy Mapping**

PPJ, Vol. 26 (2004), pp. 67-78

Renan P. Limjuco, Ph.D

San Pedro College

12 C. de Guzman Street

Davao City

**Abstract**

Students in introductory physics approach problem solving in a formulaic manner. They believe that the analysis of a physical situation simply consist of procedural and routine elements that include diagrams, labeled arrows, and derived equations. These learners have adopted these problem solving strategies through their teachers who probably concur to the idea that rote method of analysis is adequate for a lot of physics problems. However, recent studies show that under this conventional instruction, students easily get confused because the procedural knowledge from the textbook does not totally address the naive beliefs and misconceptions of the students regarding the basic idea of physics. There is a suggestion that mathematical modeling might improve significant physics instruction.

This paper discusses the application of the modeling theory of physics instruction as advanced by David Hestenes on problem solving in introductory physics course. Specifically, it shows how the model specification in strategy mapping can facilitate the analytical and evaluate skills of the students in problem solving. Discussed in the material are the dimensions of modeling-decontextualized physics situation, situation map, motion map, force map, equations, and interaction laws or functions. Also included in the report is the suggested methodology for the classroom use of the modeling theory via model specification embedded in the strategy mapping.

**26.13 A Method of Measuring The Sound Level of Machine Noise**

PPJ, Vol. 26 (2004), pp. 79-89

Hope M. Bandal, Ph.D

Physics Department

Silliman University

Dumaguete City

**26.14 Gamma Absorption Coefficients of Some Philippine Hardwoods**

PPJ, Vol. 26 (2004), pp. 90-102

Gerardo C. Maxino and Cherry Mae N. Enario

Environmental Radioactivity Research Laboratory

Physics Department, Silliman University

Dumaguete City 6200

### **Abstract**

With the use of pulse-height analysis, the gamma linear and mass absorption coefficient of 11 Philippine hardwoods were determined for gamma energy of 0.662 Mev from Cs<sup>137</sup>. The values obtained ranged from 0.043 per cm to 0.094 per cm for the linear absorption coefficients and 0.093 cm<sup>2</sup> /g to 0.15 cm<sup>2</sup> /g for the mass absorption coefficients.

- 26.15 **25<sup>th</sup> National Physics Convention and Seminar-Workshop**  
**16<sup>th</sup> National Physics Olympics**  
**11<sup>th</sup> National Physics Fair**  
April 2-5, 2003  
Samar State Polytechnic College  
Catbalogan, Samar 6700  
375 Participants  
From Luzon, Visayas and Mindanao
- 26.16 **2003 Philippine Physics Society Luzon Conference**  
October 3-4, 2003  
Mapua Institute of Technology  
Intramuros, Metro Manila  
194 Participants
- 26.17 **2<sup>nd</sup> PPS-Siquijor Chapter Regional Seminar-Workshop on In-expensive Physics Laboratory Instrumentation**  
August 15-16, 2003  
Siquijor State College  
Larena, Siquijor  
99 Participants

## **Philippine Physics Journal, Vol. 25 (2003)**

- 25.01 **Student Experiment to Plot Magnetic Field Intensity**  
PPJ, Vol. 25 (2003), pp. 1-5  
Francisco Glover, SJ and Kristine Rodriguez  
Physics Department  
Ateneo de Davao University  
Davao City

### **Abstract**

Details of a college-level student laboratory experiment to measure the magnetic field intensity normal to the plane of a rectangular loop current are described. Based on the Biot-Savart law, a general expression is derived for the loop field intensity at any point in the plane, within or outside a rectangular loop centered at the origin. Values are normalized in terms of a value of 100 units at the origin. In the experimental apparatus, an alternating current is passed through a multiturn rectangular loop. The resulting voltage induced in a small movable search coil is measured. This is proportional to the magnetic field intensity at the point. Field intensity contours are easily plotted.

#### **25.01 Professional Advancement of Tertiary Physics Teachers in Central Visayas, 1989 – 1999**

PPJ, Vol. 25 (2003), pp. 6-14

Dr. Asonita J. Parmisana

College of Arts and Sciences

Cebu Doctors' College

6200 Cebu City

#### **25.03 Free Wheel Racing**

PPJ, Vol. 25 (2003), pp. 15-20

R.B. Balili

Department of Physics

MSU-Iligan Institute of Technology

Iligan City 9200

ryan@physics.msuiit.edu.ph

### **Abstract**

The dynamics of combined translation and rotation of rigid bodies can be demonstrated using simple carts and wheels rolling freely on an inclined plane. Effects of different parameters are presented with thorough analysis and mathematical formulations. Variations in a demonstration can be made to illuminate the key features of its mechanics.

#### **25.04 Axon2003 Idea Processor for Physics Education**

PPJ, Vol. 25 (2003), pp. 21-25

Julius M. Jose<sup>a</sup> and George M. Jose<sup>b</sup>

<sup>a</sup> San Aurelio National High School

San Aurelio 2442, Balungao, Pangasinan



[drj2\\_list@yahoo.com](mailto:drj2_list@yahoo.com)

<sup>b</sup> ERODS MEDIA

[georgejose\\_ph@yahoo.com](mailto:georgejose_ph@yahoo.com)

### **Abstract**

Education research during the 1960's had brought about the development of teaching strategies such as concept mapping. Concept mapping brought a twist to the traditional numerical side of Physics to a more conceptual way, as an introduction to its mathematical foundation. And now recent development and integration of ITC in education make the technique easier to use with a click of a mouse. This paper will discuss the features and strategies for using AXON2003 software for physics. This will include benefits such as creation of concept maps and outlining and presenting students' ideas and concepts.

#### **25.05 The Measurement of Planck's Constant $h$ with Phototubes, LED's, and Light Bulbs: A Brief and Partial Survey**

PPJ, Vol. 25 (2003), pp. 26-39

Josh Emmanuel C. Alquiza

Instructional Physics Toys Research Laboratory

Physics Department, Silliman University

6200 Dumaguete City

#### **25.06 The Determination of Plank's Constant $h$ with an Inexpensive, Self-Made Apparatus**

PPJ, Vol. 25 (2003), pp. 40-45

Josh Emmanuel C. Alquiza and Gerardo Maxino, Ph.D

Instructional Physics Toys Research Laboratory

Physics Department, Silliman University

6200 Dumaguete City

#### **25.07 Common Errors and Misconceptions in Basic Mathematics**

PPJ, Vol. 25 (2003), pp. 46-56

Ed van den Berg, Ph.D

Centre for International Cooperation, Vrije Universiteit

De Boelelaan 1105, 1081 HV Amsterdam, Netherlands

[edberg51@planet.nl](mailto:edberg51@planet.nl)

#### **25.08 The Use of Rubrics Method in Teaching Physics\***

PPJ, Vol. 25 (2003), pp. 57-70

Roel D. Taroc<sup>a</sup>, MAST Physics and Gil Nonato C. Santos<sup>b</sup>, MS Physics

<sup>a</sup>Siquijor State College

6226 Larena Siquijor

[wingroe@netscape.net](mailto:wingroe@netscape.net)

<sup>b</sup>De La Salle University

2401 Taft Avenue, Manila

[cosgncs@mail.dlsu.edu.ph](mailto:cosgncs@mail.dlsu.edu.ph)

25.09 **Radioactive Decay: A Laboratory Simulation with Drinking Straws**

PPJ, Vol. 25 (2003), pp. 71-81

Gerardo C. Maxino Ph.D

Environmental Radioactivity Research Laboratory

Physics Department, Silliman University

6200 Dumaguete City

25.10 **24<sup>th</sup> National Physics Convention and Seminar-Workshop  
15<sup>th</sup> PPS National Physics Olympics  
10<sup>th</sup> National Physics Fair**

April 3-6, 2002

Silliman University

Dumaguete City

472 Participants

From Luzon, Visayas and Mindanao

25.11 **Regional Seminar-Workshop on Teaching Optics, Electricity and Nuclear Physics**

August 16-17, 2002

Siquijor State College

Larena, Siquijor 6226

177 Participants

25.12 **Philippine Physics Society Seminar-Workshop**

October 21-22, 2002

Adamson University

Ermita, Manila

150 Participants

25.13 **First Diocesan Physics Seminar-Workshop on Electricity and Electronics**

November 15, 2002

Immaculate Heart Academy

Tanjay City, Negros Oriental 6204

66 Participants

## **Philippine Physics Journal, Vol. 24 (2002)**

24.01 **Physics and Culture: A Shared Reflection**

PPJ, Vol. 24 (2002), pp. 1-5

Francisco Glover, SJ<sup>a</sup>, Ed van den Berg<sup>b</sup>, Vicenta C. Maxino<sup>c</sup> and Gerardo C. Maxino<sup>c</sup>

<sup>a</sup>Ateneo de Davao University, Davao City

<sup>b</sup>University of San Carlos, Cebu City

<sup>c</sup>Silliman University, Dumaguete City

24.02 **Teaching, Learning, and Quick Feedback Methods in the Philippines**

PPJ, Vol. 24 (2002), pp. 6-13

Ed van den Berg

University of San Carlos

Talamban Campus, Cebu City

24.03 **Gamma Spectroscopic Analysis of Soil Samples from Kayaso Cave and its Vicinity, Mabinay, Negros Oriental**

PPJ, Vol. 24 (2002), pp.14-29

Dr. Vicenta C. Maxino

Environmental Radioactivity Research Laboratory

Physics Department, Silliman University

Dumaguete City

24.04 **The Magneto-Optical Trap: Set-up and Measurements**

PPJ, Vol. 24 (2002), pp. 30-34

John Waruel F. Liwag  
Department of Physics  
University of San Carlos  
Talamban Campus  
6000 Cebu City  
[jwfliwag@cnms.net](mailto:jwfliwag@cnms.net)

24.05 **A Computer-Based Gamma Spectrometry in Teaching Environmental Radioactivity**

PPJ, Vol. 24 (2002), pp. 35-40  
Gerardo C. Maxino Ph.D  
Environmental Radioactivity Research Laboratory  
Physics Department, Silliman University  
Dumaguete City

24.06 **Computer-Based Sound Transmission Measurements**

PPJ, Vol. 24 (2002), pp. 41-51  
Dr. Vicenta C. Maxino  
Physics Department, Silliman University  
6200 Dumaguete City, Philippines

24.07 **Environmental Radioactivity Measurements in Negros Oriental, 1981-1998: A Brief and Partial Survey**

PPJ, Vol. 24 (2002), pp. 52-59  
Anatoly Karpov P. Buss  
Environmental Radioactivity Research Laboratory  
Physics Department, Silliman University  
Dumaguete City

24.08 **Some Inexpensive, Improvised Physics Apparatus for Class Demonstration or Experiment**

PPJ, Vol. 24 (2002), pp. 60-66  
Hope M. Bandal Ph D  
Physics Department  
Silliman University  
Dumaguete City

24.09 **Concept Maps and Student Performance**

PPJ, Vol. 24 (2002), pp. 67-80

Julius M. Jose

San Aurelio National High School

San Aurelio, Balungao

Pangasinan 2442

**Abstract**

This study was designed to determine the relationship between the use of concept mapping and the performance of students in Science and Technology IV (Physics)

The result of the study indicates a positive relationship between the use of concept mapping and student performance and implies that concept mapping is an effective strategy in teaching Science and Technology IV in important cognitive areas of knowledge, application, analysis, and synthesis.

24.10 **Investigative Sound Analyses and Sound Level Survey on Ambient Noise of Cebu Private Power Corporation at Barangay Ermita, Cebu City**

PPJ, Vol. 24 (2002), pp. 81-89

Helena de los Reyes MS Physics, Cherlie O. Yap MS Physics, Antonio Mayo MA and Fr. Herman van Engelen, Ph.D., SVD

University of San Carlos

6000 Cebu City

24.11 **Ambient Gamma Measurements and Radiation Maps in Central Visayas: Brief Review and Update**

PPJ, Vol. 24 (2002), pp. 90-97

John Carl P. Villanueva, Zarujo C. Girasol, Gerardo C. Maxino

Physics Department, Silliman University

6200 Dumaguete City

24.12 **23<sup>rd</sup> National Physics Convention and Seminar-Workshop  
14<sup>th</sup> PPS National Physics Olympics**

**9<sup>th</sup> National Physics Fair**

April 4-7, 2001

Divine Word College of Tagbilaran

Tagbilaran City 6300

454 Participants

From Luzon, Visayas, and Mindanao

**24.13 Seminar Workshop on Physics in Agriculture**

January 18, 2002

Negros State College of Agriculture

Kabankalan City, Negros Occidental 6111

96 Participants

**24.14 5<sup>th</sup> PPS-Bukidnon Chapter Seminar-Workshop on Physics Teaching-  
A Commitment**

January 25-26, 2002

Central Mindanao University

Musuan, Bukidnon

38 Participants

## **Philippine Physics Journal, Vol. 23 (2001)**

**23.01 Physics Para Sa Mahirap: A Shared Reflection**

PPJ, Vol. 23 (2001), pp. 1-4

Francisco Glover, SJ<sup>a</sup>, Gerardo C. Maxino<sup>b</sup>, Pelagia D. Joven<sup>c</sup>, Vicenta C. Maxino<sup>b</sup>

<sup>a</sup>Ateneo de Davao University, Davao City

<sup>b</sup>Silliman University, Dumaguete City

<sup>c</sup>Urios College, Butuan City

**23.02 A Laboratory Power Supply**

PPJ, Vol. 23 (2001), pp. 5-6

Francisco Glover, SJ

Ateneo de Davao University

Davao City

**23.03 Beowulf-Class Computer System at MSU-IIT**

PPJ, Vol. 23 (2001), pp. 7-12

Allen S. Dahili

Computational Physics Laboratory

MSU-Iligan Institute of Technology

Iligan City 9200, Philippines  
[allen@physics.msuiit.edu.ph](mailto:allen@physics.msuiit.edu.ph)

### **Abstract**

A Beowulf class computer system is a type of parallel or distributed system which consists of interconnected commodity-of-the shelf (COTS) personal computers working together as a single integrated computing resource [2,3]. A certain computational task could be divided among the computers that can result to faster execution of the task [2,11]. At MSU-IIT Beowulf system has been utilized in the study of molecular structures, using GAMESS [5] GROMACS [6], and parallel computing education. An ongoing research is done to use CERNLIB, ROOT [12], JSF [7] and LCLIB [8] in the cluster environment. These softwares are used for the high energy physics simulations for the Joint Linear Collider (JLC).

## 23.04 **Introduction to High Energy Physics Computer Simulations Using JSF**

PPJ, Vol. 23 (2001), pp. 13-23

Allister Levi C. Sanchez<sup>1</sup>, Angeline M. Bacala<sup>1</sup>, Akiya Miyamoto<sup>2</sup>,  
Kiesuke Fujii<sup>2</sup>

<sup>1</sup> IITHEP, Department of Physics, MSU-Iligan Institute of Technology  
Iligan City 9200

<sup>2</sup> High Energy Accelerator Research Organization (KEK)  
Tsukuba, Japan

### **Abstract**

Computers have been indispensable to the field of High Energy Physics. Computer simulations of experiment, done before experiments are actually performed, have been largely successful in guiding the course of those experiments, in many cases predicting the possible outcomes.

In this paper, we provide an introduction to such a simulation tool: JLC Study Framework (JSF). We discuss the processes of event generation, and data analysis. These processes are illustrated using the features provided by JSF.

At the end, we present an example of a simulation study on the detection and measurement of the Higgs boson in the Japan Linear Collider (JLC) presently conducted at the MSU-IIT High Energy Physics Laboratory (IITHEP).

23.05 **Time Spectra of Muon Decay**

PPJ, Vol. 23 (2001), pp. 24-31

R. L. Reserva, R. S. Solidum and A. M. Bacala

Department of Physics

MSU-IIT, Iligan City

**Abstract**

Recent measurements on the time spectra of atmospheric muon decay have been carried out at Iligan Institute of Technology High Energy Physics (IITHEP) Laboratory, Iligan City. A vertical stack of three plastic detectors is utilized to identify cosmic ray muons decaying in a wooden absorber. The method employed is a measurement of the distribution in the duration of the time interval between the stopped muon in the plastic scintillator detector and the detection of the emitted electron [1] in the downward direction.

The standard nuclear physics instrumentation, Nuclear Instruments Modules (NIM) and Computer Automated Measurement and Control (CAMAC), are used in this study. A brief description of the properties and the electro weak decay of muon  $\mu \rightarrow eV_eV_\mu$  are discussed. The experimental methods and techniques are given.

In this paper, a muon decay time distribution curve is shown where a fit of the distribution to the exponential  $(-t/\tau_\mu)$  yields a mean lifetime of muon decay  $\tau_\mu = 2.176 \pm 0.0429 \mu s$ , is a value, which is remarkable in good agreement with the internationally accepted value of  $2.197 \pm 0.0004 \mu s$  published in the *1998 Physical Review D*.

23.06 **Radioactivity of Some Root Crops from Negros and Siquijor, Philippines (1997-2000)**

PPJ, Vol. 23 (2001), pp. 32-38

Gerardo C. Maxino, Ph.D.

Environmental Radioactivity Research Laboratory

Physics Department, Silliman University

6200 Dumaguete City

**Abstract**

The radioactivity of 27 root crop samples from different localities of Negros and Siquijor Islands, Philippines were measured during the period 1997-2000. Five of these samples exhibited radioactivity definitely above the detection limit.

23.07 **Making Science Visible: Center of Mass Demos**



PPJ, Vol. 23 (2001), pp. 39-42  
Ed van den Berg, Ph.D  
Science and Mathematics Education Institute  
University of San Carlos, Talamban Campus  
Cebu City, Philippines  
[edberg@cnms.net](mailto:edberg@cnms.net)

**23.08 The Dependence of the Index of Refraction of Distilled Water on Temperature and Wavelength**

PPJ, Vol. 23 (2001), pp. 43-50  
Dr. Vicenta C. Maxino and Philip R. Torres  
Acoustics and Materials Research Laboratory  
Silliman University, Dumaguete City

**23.09 Compositional Analysis of TiN Thin Film on Si Substrate Using Back Scattered Electron Imaging**

PPJ, Vol. 23 (2001), pp. 51-54  
Christopher T. Que, R.C. Torralba, G.N.C. Santos, and R.V. Quiroga  
Solid State Physics Laboratory, De La Salle University  
Metro Manila  
[cosctq@mail.dlsu.edu.ph](mailto:cosctq@mail.dlsu.edu.ph), [cosret@mail.dlsu.edu.ph](mailto:cosret@mail.dlsu.edu.ph), [cosgncs@mail.dlsu.edu.ph](mailto:cosgncs@mail.dlsu.edu.ph),  
[cosrvq@mail.dlsu.edu.ph](mailto:cosrvq@mail.dlsu.edu.ph)

**Abstract**

Compositional analysis of TiN films on Si substrate was performed using Back Scattered Electron Imaging. From the degree of brightness of the surface of the sample, TiN and the Si substrate can be easily distinguished. The results were verified using EDX analysis.

**23.10 Effect of a Microanomaly on Ambient Gamma Radiation Measurement**

PPJ, Vol. 23 (2001), pp. 55-60  
Gerardo C. Maxino, Ph.D. and Giselle Ann J. Alcoran  
Environmental Radioactivity Research Laboratory  
Physics Department, Silliman University  
Dumaguete City

**23.11 Construction of the Taylor Tube: Preliminary Tests and Measurements**

PPJ, Vol. 23 (2001), pp. 61-58  
Hope Maxino Bandal Ph D  
Acoustics and Materials Research Laboratory  
Physics Department, Silliman University  
Dumaguete City

23.12 **22<sup>nd</sup> National Physics Convention and Seminar-Workshop**  
**13<sup>th</sup> PPS National Physics Olympics**  
**8<sup>th</sup> National Physics Fair**

April 4-7, 2000  
Urios College  
Butuan City 8600  
327 Participants  
From Luzon, Visayas and Mindanao

23.13 **National Seminar-Workshop on Instructional Imaging**

July 8, 2000  
Silliman University  
Dumaguete City 6200  
10 Participants

23.14 **Regional Seminar on Upgrading Physics Teaching**

February 15-16, 2001  
College of Education  
Samar State Polytechnic College  
Catbalogan, Samar  
128 Participants

23.15 **Regional Seminar on the Thin Film Technologies in the Philip-  
pines and High Temperature Superconductivity**

February 23, 2001  
Silliman University  
Dumaguete City 6200  
67 Participants

**Philippine Physics Journal, Vol. 22 (2000)**

22.01 **Physics Associations: A Channel for Promoting Science Technology Literacy**

PPJ, Vol. 22 (2000), pp. 1-8

Hope M. Bandal, Ph. D

Physics Department, Silliman University

Dumaguete City

**Abstract**

One of the strategies that can be used for promoting science and technology literacy is the building of a strong physics community that practices self-reliance and sharing. This scheme is called for the existing situation of inadequate and meager resources in terms of physics teachers and basic laboratory facilities. This dearth hampers the thrust towards relevant and quality physics education.

To build a strong physics community, physics teachers have to organize themselves into a group, assess their resources and capabilities, identify their needs and the activities they can undertake, then develop a strategy and an organizational culture that can sustain the group's activities. The Philippine Physics Society (PPS), using such an approach, is presented as a case study. This paper presents its philosophy, programs, activities, and impact.

22.02 **The BS Physics Program at Silliman University: A Curricular Innovation**

PPJ, Vol. 22 (2000), pp. 9-17

Dr. Vicenta C. Maxino

Silliman University, Dumaguete City

**Abstract**

Considering the small enrollment of the BS Physics program throughout the country, the paper presents the result a curricular innovation done at Silliman University, Dumaguete City. BS Physics With Emphasis in Computer Applications was offered at Silliman University in 1992 followed by BS Physics With Emphasis in Medical Applications a year later. This innovative curriculum is discussed, analyzed and compared with a traditional BS Physics curriculum. The yearly enrollment of the program, the employment distribution of its graduates and the problems that it faces are given.

22.03 **From Folk Toys to Physics of Liquids**

PPJ, Vol. 22 (2000), pp. 18-24

Gerardo C. Maxino  
Physics Department, Silliman University  
Dumaguete City

**Abstract**

This paper presents the use of folk toys as an approach to make the learning of physics of liquids more interesting and understandable in a climate of paucity of learning resources and of cultural deprivation. The methodology employed involves a survey of folk toys in the community, their classification according to the main areas of physics, the identification of the physics principles and concepts implicit in their construction and use, and the design of demonstrations and quantitative experiments. Folk toys can improve the teaching of physics of liquids, covering such topics as Archimedes' principle of buoyancy, liquid pressure, surface tension, capillarity, flow through an orifice, flow through a constriction, liquid resistance, viscosity, and others.

**22.04 A Cheaper Alternative for a Lock-In Amplifier to Frequency Stabilize a Laser to an Optical Transition**

PPJ, Vol. 22 (2000), pp. 25-30

Marian F. Baclayon, John W. Liwag and Gerrit J. Kuik

Department of Physics

University of San Carlos

Talamban Campus, Cebu City

**22.05 Boyle's Law: A Simple Experiment**

PPJ, Vol. 22 (2000), pp. 31-37

Tomoaki Fukuda and Jo-ann M. Cordovilla

Regional Science Teaching Center

Bicol University, Legaspi City

**22.06 Some Toys Used For Teaching/ Learning Rotational Motion: A Brief Review**

PPJ, Vol. 22 (2000), pp. 38-44

Ma. Lina R. Eparwa

St. Joseph Seminary College

Sibulan, Negros Oriental

**22.07 Optical Methods of Aerosol Measurement: The Optical Par-**

**ticle Counter**

PPJ, Vol. 22 (2000), pp. 45-53

Clare C. Maxino

Ateneo de Manila University

Loyola Heights, Quezon City

**22.08 Coefficient of Linear Expansion of Selected Philippine Hard-wood**

PPJ, Vol. 22 (2000), pp. 54-58

Hope M. Bandal Ph D and Juvelyn S. Reniva

Silliman University, Dumaguete City

**22.09 X-ray Intensity Reduction Using Niobi-X**

PPJ, Vol. 22 (2000), pp. 59-64

Gerado C. Maxino Ph D<sup>a</sup> and Asonita J. Parmisana<sup>b</sup>

<sup>a</sup> Environmental Radioactivity Research Laboratory

Physics Department, Silliman University

Dumaguete City

<sup>b</sup> College of Arts and Sciences

Cebu Doctors College

Cebu City

**22.10 Notes on Measurements with a Stroboscope**

PPJ, Vol. 22 (2000), pp. 55-57

Manuel A. Almeraz

College of Arts and Sciences

University of Southeastern Philippines

Davao City

**22.11 21<sup>st</sup> National Physics Convention and Seminar-Workshop**

**12<sup>th</sup> PPS National Physics Olympics**

**7<sup>th</sup> National Physics Fair**

April 7-10

Liceo de Cagayan University

Cagayan de Oro City 9000

287 Participants

- 22.12 **Math-Science Seminar-Workshop**  
 October 15, 1999  
 Divine Word College of Bangued  
 Bangued, Abra  
29 Participants
- 22.13 **First Joint Division Physics Seminar-Workshop in Caraga Region**  
 Area I (Agusan del Norte, Agusan del Sur and Butuan City)  
 November 11, 1999  
 Urios College  
 Butuan City  
52 Participants
- 22.14 **First Joint Division Physics Seminar-Workshop in Caraga Region**  
 Area II (Surigao del Sur, Siargao, Surigao del Norte, Surigao City)  
 November 12, 1999  
 Surigao City Pilot School  
 Surigao City  
45 Participants
- 22.15 **Seminar on Electromagnetism and Optics: Interactive Teaching**  
 February 5, 2000  
 University of San Carlos-Talamban  
 Cebu City  
109 Participants
- 22.16 **Seminar-Workshop on Creative Thinking**  
**11<sup>th</sup> General Assembly**  
**Philippine Physics Society-Cebu Chapter**  
 Cebu Doctor's College  
 Cebu City  
50 Participants
- 22.17 **Updates in Physics and Chemistry**  
 August 26, 1999

Silliman University  
Dumaguete City  
77 Participants

**22.18 Inter-Regional Seminar-Workshop on Optical Refraction and Instructional Imaging**

July 23-24, 1999  
Physics Department  
Silliman University  
Dumaguete City  
8 Participants

## **Philippine Physics Journal, Vol.21 (1999)**

**21.01 What is Science?**

PPJ, Vol. 21 (1999), pp. 1-5  
Dr. Martin Phipps  
Physics Department, University of San Carlos  
Talamban Campus, Cebu City

**21.02 Home-Made Logic Gate Demonstrator**

PPJ, Vol. 21 (1999), pp. 6-7  
Francisco Glover, Ph D, S.J. and Takayuki Nitta  
Regional Science Teaching Center  
Ateneo de Davao University  
Davao City

**21.03 An Overview of Signal Processing Techniques**

PPJ, Vol. 21 (1999), pp. 8-11  
Zarugo C. Girasol  
Physics Department, Silliman University  
Dumaguete City

**21.04 Sound Analysis of the Noise from a Punch Press**

PPJ, Vol. 21 (1999), pp. 12-20  
Cherile Obate-Yap

Department of Physics  
University of San Carlos, Cebu City

21.05 **Physics Literature in Central Visayas, Philippines, 1955-1995**  
PPJ, Vol. 21 (1999), pp. 21-40  
Gerardo C. Maxino, Ph D  
Silliman University, Dumaguete City

21.06 **Application of Artificial Neural Network in Stereoscopic Computer Vision: A Preliminary Study**  
PPJ, Vol. 21 (1999), pp. 41-56  
Clare C. Maxino and Rommel G. Bacabac, SVD  
University of San Carlos  
Cebu City

21.07 **20<sup>th</sup> National Physics Convention and Seminar-Workshop**  
**11<sup>th</sup> National Physics Olympics**  
**6<sup>th</sup> National Physics Fair**  
April 1-4, 1998  
University of San Carlos  
Cebu City  
269 Participants

## **Philippine Physics Journal, Vol. 20 (1998)**

20.01 **Why Should We Care About Particle Physics?**  
PPJ, Vol. 20 (1998), pp. 1-4  
Dr. Martin Phipps  
Physics Department  
University of San Carlos  
Talamban Campus  
6000 Cebu City

20.02 **Materials For Teaching About Energy**  
PPJ, Vol. 20 (1998), pp. 5-10  
Ed van den Berg<sup>a</sup> and Wim Grosheide<sup>b</sup>



<sup>a</sup> University of San Carlos  
Talamban Campus

6000 Cebu City

<sup>b</sup> Hermann Wesselink College  
Amstelveen, Netherlands

**20.03 Modernizing Physics Education: Implementation And Implications**

PPJ, Vol. 20 (1998), pp. 11-13

Gerardo C. Maxino

Physics Department

Silliman University

6200 Dumaguete City

**20.04 An Introduction To Lasers And Some Applications**

PPJ, Vol. 20 (1998), pp. 14-21

Gerrit J. Kuik, Ph.D.

Physics Development Project

University of San Carlos

Talamban Campus

6000 Cebu City

**20.05 Two Proposed Experiments For The University Of San Carlos Optics Laboratory**

PPJ, Vol. 20 (1998), pp. 22-31

Helena S. de los Reyes, MS Physics

University of San Carlos

Talamban Campus

6000 Cebu City

**20.06 Reduction Of Radiation Intensity Using An Extra Filter: A Laboratory Module**

PPJ, Vol. 20 (1998), pp. 32-36

Asonita Jabla Parmisana

Cebu Doctors College

6000 Cebu City

- 20.07 **Free Fall And "Not-Free" Fall**  
PPJ, Vol. 20 (1998), pp. 37-38  
Ed van den Berg  
Science and Mathematics Education Institute  
University of San Carlos  
Talamban Campus  
6000 Cebu City
- 20.08 **Radioactivity Of Some Banana Varieties From Negros Oriental, 1997-1998**  
PPJ, Vol. 20 (1998), pp. 39-46  
Vicenta Cabahug Maxino  
Physics Department, Silliman University  
6200 Dumaguete City
- 20.09 **The Versatile Taylor Tube**  
PPJ, Vol. 20 (1998), pp. 47-50  
Hope Maxino Bandal  
Physics Department  
Silliman University  
6200 Dumaguete City
- 20.10 **19<sup>th</sup> National Physics Convention and Seminar-Workshop**  
**10<sup>th</sup> National Physics Olympics**  
**5<sup>th</sup> National Physics Fair**  
April 1-4, 1997  
Silliman University  
Dumaguete City  
236 Participants

## **Philippine Physics Journal, Vol. 18-19 (1996-1997)**

- 18-19.01 **Nichood Through Quality Physics Education**  
PPJ, Vol. 18-19 (1996-1997), pp. 1  
Angel C. Alcalá, Ph.D.

Chairman, Commission on Higher Education  
Metro Manila

18-19.02 **Why Physics?**

PPJ, Vol. 18-19 (1996-1997), pp. 2-4  
Francisco Glover, S.J.  
Ateneo de Davao University  
Davao City

18-19.03 **A Survey Of Street Noise In Downtown Dumaguete City**

PPJ, Vol. 18-19 (1996-1997), pp. 5-12  
Hope Maxino Bandal, Ph.D.  
Silliman University  
Dumaguete City

18-19.04 **Concept Mapping, Gowin's Vee And The Learning Theories Around**

PPJ, Vol. 18-19 (1996-1997), pp. 13-22  
Nenita A. Malaluan, Ph.D.  
Ateneo de Davao University  
Jacinto St., Davao City

18-19.05 **Laser-Induced Fluorescence Spectra Of Some Green Plants Commonly Found In The Philippines**

PPJ, Vol. 18-19 (1996-1997), pp. 23-28  
Raymund S. Vizcarra and Minella C. Alarcon  
Department of Physics  
Ateneo de Manila University  
Quezon City, Philippines

**Abstract**

Laboratory and aerial remote experiments using the laser-induced fluorescence (LIF) properties of plants have been conducted to detect vegetation, plant stress, and to identify plant groups or plant species. An investigation was made on the feasibility of using laser-induced fluorescence as a technique to identify Philippine green plants. A 337.1 nm output nitrogen laser was used to induce fluorescence. The measured LIF spectra of freshly cut leaves of bamboo, coconut, palm, papaya, and starapple are presented. Experimental results and analysis of the

LIF spectra are discussed.

**18-19.06 High Power Molecular Gas Laser: The Carbon Dioxide Laser**

PPJ, Vol. 18-19 (1996-1997), pp. 29-38

Raul R. Olaguer

Division of Physical Sciences and Mathematics

University of the Philippines - Visayas

Miagao, Iloilo

**18-19.07 Water Studies In Cebu: A Review**

PPJ, Vol. 18-19 (1996-1997), pp. 39-45

Florencio Labiste

St. Mary Academy

Oslob, Cebu

**18-19.08 Physical Properties Of Some Cooking Oils**

PPJ, Vol. 18-19 (1996-1997), pp. 46-54

Vicenta C. Maxino and Dinah Rose M. Baseleres

Silliman University

**18-19.09 18<sup>th</sup> National Physics Convention and Seminar-Workshop**

**9<sup>th</sup> National Physics Olympics**

**4<sup>th</sup> National Physics Fair**

April 9-12, 1996

Ateneo de Davao University

Davao City

271 Participants

**Philippine Physics Journal, Vol. 16-17  
(1994-1995)**

**16-17.01 The Philippine Physics Journal: First Fifteen Years With Annotated Bibliography, 1979-1993**

PPJ, Vol. 16-17 (1994-1995), pp. 1-17

Gerardo C. Maxino, Ph D

Dean, College of Arts and Sciences

Silliman University  
6200 Dumaguete City

16-17.02 **Notes On Physics In The Year 2000**

PPJ, Vol. 16-17 (1994-1995), pp. 18-23

Michael McInerney, Ph D

Rose-Hulman Institute of Technology

Terra Haute, Indiana, USA

(Fulbright Visiting Professor at the University of San Carlos, Cebu City)

16-17.03 **Young's Modulus Of Certain Kinds Of Leather**

PPJ, Vol. 16-17 (1994-1995), pp. 24-32

Dr. Hope M. Bandal and Maria Corina E. Camazo

Silliman University

16-17.04 **Notes On The Status Of Nuclear Science In The Philippines**

PPJ, Vol. 16-17 (1994-1995), pp. 33-36

Aida Davila Eugenio

Deputy Director

Philippine Nuclear Research Institute

Diliman, Quezon City

16-17.05 **Making The Physics Program Relevant In The Aviation Maintenance Technology Curriculum: A Rationale**

PPJ, Vol. 16-17 (1994-1995), pp. 37-40

Nathaniel M. Heralde

Philippine State College of Aeronautics

Mactan Air Base, Lapulapu City

16-17.06 **Physics Education For Scientific And Technological Literacy**

PPJ, Vol. 16-17 (1994-1995), pp. 41-48

Dr. Bruce Marsh

State University of New York-Albany

Albany, New York, United States of America

**Abstract**

As physics educators we wish to impart scientific literacy to members of the general public so that they may (1) benefit personally from

an understanding of the way nature and technology work in phenomena and devices encountered in everyday life, (2) become more productive members of our increasingly technological society, and (3) share our intellectual enjoyment in partial comprehension of the universe. The minimum requirements for scientific literacy are a firm belief in experimental evidence for relating cause and effect, a good understanding of basic concepts in science, and the ability to read and interpret different representations of quantitative information, including relations among quantities. The different representations include words, diagrams, tables of numbers, and graphs. Scientific literacy does not require an ability to manipulate symbolic equations, but it does require facility in the use of ratios and proportions.

**16-17.07 Photovoltaic Pumping Systems (Design Calculations And Layout)**

PPJ, Vol. 16-17 (1994-1995), pp. 49-59

Bernd Fahlenbock

GTZ Adviser

Philippine-German Photovoltaic Pumping Project

University of San Carlos

**16-17.08 Radioactivity Of Some Grass And Vegetable Samples From Negros Oriental, 1983-1996**

PPJ, Vol. 16-17 (1994-1995), pp. 60-69

Vicenta C. Maxino

Physics Department, Silliman University

**16-17.09 16<sup>th</sup> National Physics Convention and Seminar-Workshop**

**7<sup>th</sup> National Physics Olympics**

**2<sup>nd</sup> National Physics Fair**

April 5-8, 1994

University of Eastern Philippines

University Town, Catarman

Northern Samar

107 Participants

**16-17.10 17<sup>th</sup> National Physics Convention and Seminar-Workshop**

**8<sup>th</sup> National Physics Olympics**

**3<sup>rd</sup> National Physics Fair**  
April 4-7, 1995  
Central Philippine University  
Iloilo City  
192 Participants

## **Philippine Physics Journal, Vol. 15 (1993)**

**15.01 Physics Literacy For People Empowerment**

PPJ, Vol. 15 (1993), pp. 1-6  
Herman van Engelen, SVD, Ph.D.  
University of San Carlos  
Cebu City

**15.02 Electrical Conduction: Inexpensive Experiments**

PPJ, Vol. 15 (1993), pp. 7-13  
Dr. Gerardo C. Maxino  
Professor and Chairman, Physics Department  
Silliman University  
Dumaguete City

**15.03 Introductory Physics Education For Non-Science Majors: The Silliman Experience**

PPJ, Vol. 15 (1993), pp. 14-21  
Dr. Vicenta Cabahug Maxino  
Physics Department, Silliman University  
Dumaguete City

**15.04 A Compact Fluorescent (PL) Lighting Unit For Solar Home Systems**

PPJ, Vol. 15 (1993), pp. 22-28  
Alvin N. Urgel<sup>a</sup> and Romulo G. Almia<sup>b</sup>  
<sup>a</sup> Physics Research  
University of San Carlos  
Cebu City  
<sup>b</sup> Palompon Institute of Technology

Palompon, Leyte

**Abstract**

The PL9-E is the fifth revision of the compact fluorescent (PL) lamp series developed by the Physics Research. Although intended for use in photovoltaic (PV) home lighting systems, it can be utilized in other 12 Vdc systems. Considerations for the design include technical and user requirements, as well as the local availability of components. PL fluorescent lamps are recommended for enhanced illumination and longer life compared to ordinary fluorescent tubes.

**15.05 An Experimental Determination Of Solar Power Using A Self-Designed Apparatus**

PPJ, Vol. 15 (1993), pp. 29-37

Francisco E. Ablong, Jr., MAST (Physics)

Silliman University

Dumaguete City

**15.06 The Scientist As A Humanist**

PPJ, Vol. 15 (1993), pp. 38-43

Hope M. Bandal, Ph.D.

Physics Department

Silliman University

Dumaguete City

**15.07 Addressing Students' Misconceptions Of Free Fall: An Exploratory Study**

PPJ, Vol. 15 (1993), pp. 44-53

APPTEA Philippines Research Group

**15.08 Energy Conservation And Projectile Motion On A Curtain Rail Track**

PPJ, Vol. 15 (1993), pp. 54-59

Dr. Vicenta C. Maxino

Physics Department, Silliman University

Dumaguete City

**15.09 Physics Education In Central Visayas, 1953-1993**

PPJ, Vol. 15 (1993), pp. 60-70



Gerardo C. Maxino, MS Physics, Ph D  
Silliman University  
Dumaguete City

- 15.10 **15<sup>th</sup> National Physics Convention And Seminar-Workshop**  
**6<sup>th</sup> National Physics Olympics**  
**1<sup>st</sup> National Physics Fair**  
April 1-4, 1993  
University of Negros Occidental - Recoletos  
Bacolod City  
307 Participants

## **Philippine Physics Journal, Vol. 12-14 (1990-1992)**

- 12-14.01 **The Philippine Physics Society (PPS) Information And Traditions**  
PPJ, Vol. 12-14 (1990-1992), pp. 1-9  
Dr. Vicenta C. Maxino  
PPS National Secretary
- 12-14.02 **Educational Uses Of Information Technology In Research And Development In Physics**  
PPJ, Vol. 12-14 (1990-1992), pp. 10-17  
Dr. Catalina Y. Diluvio  
University of San Carlos  
Cebu City
- 12-14.03 **Learning To Understanding**  
PPJ, Vol. 12-14 (1990-1992), pp. 18-22  
Juergen Schoenherr  
Team Leader, GTZ-Science Teaching Improvement Project
- 12-14.04 **Measuring The Sun**  
PPJ, Vol. 12-14 (1990-1992), pp. 23-29  
Alvin N. Urgel

Water Resources Center  
University of San Carlos  
Cebu City

**Abstract**

The sun never fails to rise every morning. Moving across the sky from East to West. Radiant energy from the sun causes wind, waves and heat, truly a fundamental energy source. Solar energy is harnessed by plants to sustain life on planet earth.

But what is the sun made of? A great ball of fire? Will it ever stop burning? What portion of the sun's energy are we receiving? How is the sun's energy measured? What instruments are used? Does anybody ever keep track of the solar radiation? Of what importance is solar data to farmers and non-farmers?

These questions and more are addressed in this paper to give more insight about the sun's irradiance and the factors which affect it. Finally, actual measurements by a Class A sensor coupled to a digital data logger affords data of reasonable accuracy.

12-14.05 **Why Are Students Not Taking The BS Physics Degree?**

PPJ, Vol. 12-14 (1990-1992), pp. 30-35

Dr. Vicenta C. Maxino

Silliman University

12-14.06 **Folk Toys And Implements: Physics Literacy For The Masses**

PPJ, Vol. 12-14 (1990-1992), pp. 36-44

Gerardo C. Maxino, Ph D

Chairman, Physics Department, Silliman University

Dumaguete City, Philippines

**Abstract**

UNESCO's program on Education for All emphasizes the human right of access to knowledge and skills needed to exercise greater control of one's life and environment. In developing countries, functional science literacy eludes many rural dwellers.

The use of folk toys and implements in ill-equipped rural schools and adult literacy classes can improve physics education. Folk toys and implements show many physics concepts latent in a community's experience. Demonstrations and quantitative experiments have been developed. Aside from removing the dichotomy between classroom and real life, the use of folk toys and implements stimulates the develop-

ment of appropriate technology.

12-14.07 **EDCOM Recommendations And Implications To Physics Teaching**

PPJ, Vol. 12-14 (1990-1992), pp. 45-50

Dr. Vivien M. Talisayon

Deputy Director, Philippine Science High School

Professor, College of Education, University of the Philippines

12-14.08 **Sound Absorption By Styrofoam Cones**

PPJ, Vol. 12-14 (1990-1992), pp. 51-60

Hope M. Bandal, Ph.D.

Physics Department

Silliman University

Dumaguete City

12-14.09 **The Physics Of The Egg Drop**

PPJ, Vol. 12-14 (1990-1992), pp. 61-65

Dr. Gerardo C. Maxino

Chairman, Physics Department, Silliman University

Dumaguete City

12-14.10 **12<sup>th</sup> Philippine Physics Society National Convention and 3<sup>rd</sup> National Physics Olympics For Teachers**

April 5-8, 1990

Visayas State College Of Agriculture

Baybay, Leyte

122 Participants

12-14.11 **13<sup>th</sup> Philippine Physics Society National Convention and 4<sup>th</sup> National Physics Olympics For Teachers**

June 3-5, 1991

University of San Carlos

Cebu City

179 Participants

12-14.12 **14<sup>th</sup> Philippine Physics Society National Convention and  
5<sup>th</sup> National Physics Olympics For Teachers**  
April 1-4, 1992  
Divine World College of Tagbilaran  
Tagbilaran City  
140 Participants

## **Philippine Physics Journal, Vol. 9-11 (1987-1989)**

- 9-11.01 **Radioactive Pollution**  
PPJ, Vol. 9-11 (1987-1989), pp. 1-8  
Manuel R. Eugenio, Ph.D.  
Director, Science Educational Institute  
Department of Science and Technology
- 9-11.02 **Superconductor Primer And Update**  
PPJ, Vol. 9-11 (1987-1989), pp. 9-21  
Reuben Ballesil  
Mindanao State University  
Marawi City
- 9-11.03 **Radiation Mapping In Central Philippines**  
PPJ, Vol. 9-11 (1987-1989), pp. 22-26  
Vicenta C. Maxino  
Silliman University  
Dumaguete City
- 9-11.04 **Improvised Optical Lever Apparatus For Measuring Linear  
Expansion**  
PPJ, Vol. 9-11 (1987-1989), pp. 27-35  
Jimmy R. Rosillo
- 9-11.05 **The Philippine Wood Industry: Its Implications To The Envi-  
ronment And Community Development**

PPJ, Vol. 9-11 (1987-1989), pp. 36-40  
James O. Lacandula

9-11.06 **Biogas: A Non-Conventional Source Of Energy**  
PPJ, Vol. 9-11 (1987-1989), pp. 41-49  
Roque C. De Pedro Jr.

9-11.07 **The Ladder ARC: An Improvised Apparatus**  
PPJ, Vol. 9-11 (1987-1989), pp. 50-53  
Reuben Ballesil  
Mindanao State University  
Marawi City

9-11.08 **Potential Photovoltaic Applications**  
PPJ, Vol. 9-11 (1987-1989), pp. 54-58  
Alvin N. Urgel  
University of San Carlos

9-11.09 **Physics In The Classroom And Community: A Physicist's Viewpoint**  
PPJ, Vol. 9-11 (1987-1989), pp. 59-62  
Herman van Engelen, SVD, Ph.D.  
University of San Carlos  
Cebu City

9-11.10 **Physics In The Classroom And Community: An Educator's View Point**  
PPJ, Vol. 9-11 (1987-1989), pp. 63-66  
Dr. Serviliano C. de la Crus, Jr.  
Director, DECS Region VIII  
Tacloban City

9-11.11 **The Case For Scientific Literacy**  
PPJ, Vol. 9-11 (1987-1989), pp. 67-74  
Gerardo C. Maxino  
Dumaguete City

- 9-11.12 **Cebu And Its Energy Needs**  
PPJ, Vol. 9-11 (1987-1989), pp. 75-77  
Herman van Engelen, SVD, Ph.D.  
USC Water Resources Center  
University of San Carlos  
Cebu City
- 9-11.13 **9<sup>th</sup> Philippine Physics Society  
National Convention**  
April 7-10, 1987  
Urios College  
Butuan City  
146 Participants
- 9-11.14 **10<sup>th</sup> Philippine Physics Society  
National Convention and  
1<sup>st</sup> National Physics Olympics For Teachers**  
April 6-9, 1988  
Divine Word University of Tacloban  
Tacloban City  
196 Participants
- 9-11.15 **11<sup>th</sup> Philippine Physics Society  
National Convention and  
2<sup>nd</sup> National Physics Olympics For Teachers**  
April 7-10, 1989  
College of Arts and Sciences  
Central Mindanao University  
Musuan, Bukidnon  
125 Participants

## **Philippine Physics Journal, Vol. 6-8 (1984-1986)**

- 6-8.01 **Physics And The Environment**  
PPJ, Vol. 6-8 (1984-1986), pp. 1-4

Dr. Venancio L. Alcantara

6-8.02 **Communicating Physics**

PPJ, Vol. 6-8 (1984-1986), pp. 5-7

Dr. Theta C. Ponce

National Institute of Physics

University of the Philippines

Dilliman, Quezon City

6-8.03 **Physics And Social Responsibility**

PPJ, Vol. 6-8 (1984-1986), pp. 8-11

Dr. Manuel Eugenio

6-8.04 **A Study Of The Gamma Spectrum Of Some Soil Samples  
From Mabinay And Ayungon, Negros Oriental**

PPJ, Vol. 6-8 (1984-1986), pp. 12-32

Vicenta C. Maxino

6-8.05 **Environmental Radioactivity Measurements In The Visayas,  
Philippines**

PPJ, Vol. 6-8 (1984-1986), pp. 33-39

Vicenta C. Maxino and Gerardo C. Maxino

Silliman University

Dumaguete City

6-8.06 **Rain Simulator: A Physical Model Of Rainfall-Runoff**

PPJ, Vol 6-8 (1984-1986), pp. 40-50

Ed Walag

USC Water Resources Center

6-8.07 **The USC Water Resources Center: Development And Prospects**

PPJ, Vol. 6-8 (1984-1986), pp. 51-54

Fr. Herman van Engelen, SVD

USC-WRC Director

- 6-8.08 **Wind Energy**  
PPJ, Vol. 6-8 (1984-1986), pp. 55-61  
Engr. Danilo Gravador  
PNOC ERDC
- 6-8.09 **The Windmill**  
PPJ, Vol. 6-8 (1984-1986), pp. 62-65  
Dr. Venancio L. Alcantara
- 6-8.10 **An Experimental Determination Of The Solar Constant In Dumaguete City**  
PPJ, Vol. 6-8 (1984-1986), pp. 66-71  
Delilah J. Ablong  
Central Visayas Polytechnic College
- 6-8.11 **The Regulations And Licensing Of Radioactive Materials And Facilities In The Philippines - An Overview**  
PPJ, Vol. 6-8 (1984-1986), pp. 72-83  
Vangeline E. Kinilitan
- 6-8.12 **The Determination Of The Center Of Gravity Of A Thin Triangular Plate: A Mathematical Approach**  
PPJ, Vol. 6-8 (1984-1986), pp. 84-89  
Caesar V. Cavales  
Department of Mathematics  
Silliman University  
Dumaguete City
- 6-8.13 **6<sup>th</sup> (Southern) Philippine Physics Society National Convention**  
April 5-6, 1984  
University of Negros Occidental - Recoletos  
Bacolod City  
96 Participants
- 6-8.14 **7<sup>th</sup> (Southern) Philippine Physics Society National Convention**



April 12-14, 1985  
St. Paul College  
Dumaguete City  
80 Participants

6-8.14 **8<sup>th</sup> (Southern) Philippine Physics Society  
National Convention**  
April 7-10, 1986  
Central Philippine University  
Iloilo City  
122 Participants

## **Philippine Physics Journal ((S)PPS Proceedings), Vol. 4-5 (1982-1983)**

- 4-5.01 **Physics And Rural Development**  
PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 1-4  
Gerardo C. Maxino  
Silliman University
- 4-5.02 **The Role, The Selection And The Grading Of A Physics  
Course**  
PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 5-19  
Dr. Jack John Brennan, Ph.D.  
University of Central Florida
- 4-5.03 **Physics In The Philippines: Some Recommendations**  
PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 20-26  
Jack John Brennan, Ph.D
- 4-5.04 **The Analog Simulation Of The Bouncing Ball**  
PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 27-34  
Reuben Ballestil, Romeo Asibal and Fulton Yap  
Mindanao State University

Marawi City

4-5.05 **Introduction To Basic Linear Programming**

PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 35-40  
Mr. Leo I. Villagonzalo  
Mathematics Department  
Silliman University

4-5.06 **Divisibility Test**

PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 41-44  
Feliciano I. Labrador  
Mathematics Department Silliman University

4-5.07 **Physics And Energy Development**

PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 45-50  
Dr. Venancio Alcantara  
Head, Wind, Water and Wave  
Energy Research Division  
PNOC-ERDD

4-5.08 **Some Thoughts For Physicists**

PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 51-52  
Dr. Quintin S. Doromal  
President, Silliman University

4-5.09 **Comparison Of  $\pi$  And  $\rho$  Rescattering In  $p(p, p)n\pi^+$**

PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 53-62  
Jose C. Martinez  
Physics Department  
University of the Philippines  
Diliman, Q. C. Philippines 3004

**Abstract**

The role of  $\pi$   $\rho$  rescattering in  $p(p,p)n\pi^+$  is studied within the iso-bar model. It is shown that rescattering alone does not consistently fit data. Inclusion of  $\rho$  rescattering improves results. The  $\rho$  is found to appreciably cancel the  $\pi$  contribution to the T-matrix.

- 4-5.10 **General Relativity: An Overview**  
 PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 63-79  
 Roger Posadas, Ph.D.  
 President, Samahang Pisika ng Pilipinas  
 Chairman, Physics Department  
 University of the Philippines
- 4-5.11 **Teaching Physics For The Industry**  
 PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 80-86  
 Alberto M. Campos  
 Professor, College of Engineering  
 De La Salle University
- 4-5.12 **Similitude In Teaching And Research**  
 PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 87-89  
 Vivien M. Talisayon  
 UP Science Education Center  
 Diliman, Quezon City
- 4-5.13 **Philippine Atomic Energy Commission And Its Training Program**  
 PPJ ((S)PPS Proceedings), Vol. 4-5 (1982-1983), pp. 90-92  
 Totillano A. Ragot  
 Executive Assistant  
 Philippine Atomic Energy Commission  
 Diliman, Quezon City
- 4-5.14 **Fourth Southern Philippines Meeting On Physics Research And Teaching**  
 April 1-4, 1982  
 Silliman University and Foundation University  
 Dumaguete City  
74 Participants
- 4-5.15 **5<sup>th</sup> (Southern) Philippines Physics Society National Convention**  
 April 7-10, 1983

Xavier University  
Cagayan de Oro City  
87 Participants

## **Philippine Physics Journal ((S)PPS Proceedings), Vol. 2-3 (1980-1981)**

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Vicenta C. Maxino

**2-3.03 The Current Trends In Physics Teaching And Research**

PPJ ((S)PPS Proceedings), Vol. 2-3 (1980-1981), pp. 3-5  
Dr. Aurelio A. Tiro  
MEC, Region VII  
Regional Director

**2-3.04 Physics In The Secondary Level**

PPJ ((S)PPS Proceedings), Vol. 2-3 (1980-1981), pp. 6-8  
Mrs. Purita Navales

**2-3.05 Physics In The Classroom And Industry**

PPJ ((S)PPS Proceedings), Vol. 2-3 (1980-1981), pp. 9-14  
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